

عنوان مقاله:

Monitoring Urban Growth and Aerosol Trends in Tehran: Insights Using Satellite Data

محل انتشار:

سومین کنفرانس بین المللی شهر هوشمند، چالش ها و راهبردها (سال: 1402)

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خلاصه مقاله:

Rapid urbanization of Tehran and the destruction of vegetation has greatly increased the concentration of aerosol pollutants and turned air pollution into a challenge. By controlling urban boundaries in suburban areas and properly directing urban growth, it is possible to reduce particulate matters and achieve sustainable development of urban areas. This study deals with spatio-temporal analysis of urbanization in urban areas and temporal changes of aerosol in Tehran. The processing of Landsat satellite images for the years ۲۰۰۰ and ۲۰۲۱ by the supervised method of support vector machine (SVM) indicates that in the last twenty-one years, about ۱۱۹ km<sup>۲</sup> have been added to the built-up space of Tehran and about ۳۹ km<sup>۲</sup> of vegetation has been destroyed. The urban densification index identified the greatest growth of built-up space in the northern, western and southwestern peripheral areas. The overall accuracy of ۹۶% indicated the high validity of the processed images. Aerosol index was extracted from Sentinel-۵P satellite by coding in GEE environment. The temporal changes of aerosol showed the overall upward trend in the index of this pollutant. The range of changes was from -۱.۵ to ۲.۳, and the highest aerosol values were observed in hot days and seasons of the year ۲۰۲۲. The findings emphasize the adverse effects of rapid urbanization on LU/LC changes and vegetation loss. This study highlights the necessity of monitoring urban built-up densification in order to promote sustainable development and reduce health risks associated with air pollution.

کلمات کلیدی:

Landsat ۵, Landsat ۸, Sentinel-۵P, Urban Densification, Aerosol

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