

Abstract

Urban expansion brings challenges in maintaining green infrastructure to meet the needs of growing populations. Gardens, as integral elements of urban green spaces, provide multifunctional areas for recreation, relaxation, social interaction, and cultural activities. This study evaluates the impact of gardens on social and economic development within the Pimpri Chinchwad Municipal Corporation (PCMC) area, emphasizing the significance of urban green spaces in enhancing community well-being.

Using Sentinel-2 imagery, a Land Use/Land Cover (LULC) classification was performed to segment the landscape into various land cover types based on their spectral signatures. A supervised classification method, specifically Random Forest, was applied, utilizing known land cover types as training samples. The categories included vegetation, pavement, barren land, water bodies, and sand. The classification accuracy was validated through ground truth data and evaluated using confusion matrices.

The study also involved statistical analysis to explore the relationships between garden presence and various surveyed factors related to social life, health, and economy. Pearson correlation coefficients were calculated to quantify these relationships, revealing significant correlations that underscore the benefits of green spaces.

The findings indicate that gardens/parks contribute positively to social cohesion, community health, and economic vitality, highlighting their essential role in sustainable urban development. By mitigating urban heat island effects, promoting biodiversity, and enhancing the quality of urban life, gardens and other green spaces offer profound ecological, social, and economic benefits.