

Analyzing Infrastructure Service Impact on Scheme Effectiveness: A Multivariate and ANN-Based Evaluation of AMRUT

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Abstract: Rapid urbanization and population growth strain urban infrastructure, challenging cities to meet rising demands for housing, transport, healthcare, electricity, water, sanitation, and education while maintaining service quality. As economic hubs, cities face opportunities and challenges in providing amenities. The Atal Mission for Rejuvenation and Urban Transformation (AMRUT), launched by the Ministry of Housing and Urban Affairs, targets infrastructure improvement in 500 Indian cities, focusing on reliable water supply, sewerage, stormwater drainage, urban mobility, and green spaces with child-friendly features. Extended from 2021–22 to 2025–26, AMRUT adopts a project-based approach to sustain urban transformation. This study evaluates AMRUT's impact in Uttar Pradesh, focusing on Varanasi and Lucknow. The empirical analysis uses primary data from field surveys, sampling 466 beneficiaries selected via stratified proportional random sampling. An artificial neural network (ANN) models the relationship between infrastructure factors (water supply, toilets/septage, solid waste, park green space) and outcomes (benefits received, overall impact). Multivariate Multiple Regression assesses how these factors simultaneously affect the outcomes. Findings show AMRUT's effectiveness in Uttar Pradesh, improving the quality of life and strengthening local governance. Service delivery efficiency has increased, with solid waste management having the strongest positive impact, followed by park green space, which shows mixed effects (positive in some models, negative in others).

Keywords: Atal Mission for Rejuvenation and Urban Transformation, Urban Water Supply, Sewerage And Septage Management, Urban Parks and Green Spaces

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