PREFACE

Urban sprawl, the uncontrolled expansion of urban areas into rural land, is a significant issue in rapidly growing cities worldwide, including Ahmedabad, one of India's fastest-growing cities. While rapid urbanization has brought economic growth and development, it has also posed challenges to environmental sustainability and urban planning. This research, titled "Assessing Urban Sprawl Dynamics in Ahmedabad: A Shannon Entropy Approach to Analyze Growth Impact on Environmental Parameters," addresses these challenges by analyzing the city's urban sprawl and its impact on environmental parameters.

Using the Shannon Entropy method, a statistical measure of randomness or disorder, this study quantifies urban sprawl in Ahmedabad. By examining the spatial distribution and density of built-up areas, this approach provides a robust framework for understanding urban expansion patterns. The study investigates the environmental implications of urban sprawl, focusing on parameters such as albedo, earth skin temperature, precipitation, temperature, relative humidity, and population changes over a decade, comparing data from 2011 and 2021.

The research emphasizes the need for sustainable urban planning to balance growth with environmental preservation. Findings aim to inform policymakers, urban planners, and stakeholders about critical areas needing attention and intervention, elucidating the relationship between urban sprawl and environmental parameters. The goal is to foster an urban environment that supports economic and population growth, maintains ecological balance, and enhances the quality of life for its inhabitants.

This study integrates urban geography, environmental science, and spatial analysis, highlighting the complexity of urban growth and its impacts. It aims to contribute to the discourse on sustainable urban development and inspire further research in this field.