

PREFACE

Urban areas represent a complex interplay between human activities and the environment, and this dynamic is particularly evident in Delhi, India's capital. As one of the most rapidly urbanizing cities globally, Delhi faces significant environmental challenges, including deteriorating air and water quality, shrinking green spaces, and depleting groundwater resources. These challenges are exacerbated by the pressures of a growing population and the demands of economic development.

This report aims to provide a comprehensive analysis of Delhi's environmental challenges through the lens of Geographic Information Systems (GIS) and remote sensing technologies. The primary objective of this project is to develop an interactive application that visualizes various environmental parameters in Delhi. By integrating GIS and remote sensing data, the application offers detailed insights into key environmental factors, including air quality, water quality, groundwater potential zones, land use and land cover (LULC), and green spaces.

The application is designed to serve as a valuable tool for urban planners, policymakers, researchers, and the general public. It enables users to interactively explore and analyze environmental data, facilitating a better understanding of the spatial distribution and temporal trends of various environmental parameters. This interactive visualization supports data-driven decision-making and helps stakeholders implement effective strategies for environmental management and urban planning.

The methodology chapter outlines the data collection and processing techniques used in this project, including the acquisition of satellite imagery, ground-based observations, and the integration of various data sources. The report then delves into the analysis and visualization of the data, presenting maps and interactive features that highlight the current state and trends of Delhi's environment.

The results and discussion section interprets the findings, drawing attention to critical areas of concern and potential opportunities for intervention. For instance, the visualization of air quality data reveals pollution hotspots and temporal patterns, while groundwater maps identify regions at risk of depletion. The analysis of green spaces underscores the need for urban greening initiatives to mitigate the urban heat island effect and enhance biodiversity.

In conclusion, this report not only provides a detailed assessment of Delhi's environmental conditions but also demonstrates the power of GIS and remote sensing technologies in environmental monitoring and management. The interactive application developed as part of