

Green Air Quality Multiplier (GAQM) - Project Report

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1. Executive Summary

This project analyzed environmental data from 222 global cities to quantify the impact of urban vegetation on air quality (PM2.5). By controlling for GDP, Population, and Traffic (NO2), the model identified a statistically significant 'Green Air Quality Multiplier'.

2. Key Findings

- Greenness vs. Pollution: A significant negative correlation was found.
- The Multiplier: Increasing green space by 1% reduces PM2.5 by ~1.01%.
- Wealth Effect: GDP is the strongest predictor of clean air.
- Traffic: NO2 levels were controlled to isolate the 'tree effect'.

3. Deviation Analysis (The "Delhi" Factor)

The model identified cities where pollution exceeds predictions based on their greenery and wealth. These deviations indicate external factors (festivals, geography).

City	Deviation Analysis
Delhi	Pollution much higher than predicted. CHECK EXTERNAL FACTORS: Local festivals (f...
Dubai	Pollution much higher than predicted. CHECK EXTERNAL FACTORS: Local festivals (f...
Capital Governorate	Pollution much higher than predicted. CHECK EXTERNAL FACTORS: Local festivals (f...

4. Urban Planning Recommendations

Based on pollution profiles (High PM2.5 vs High NO2), the following interventions are recommended for the most polluted cities in the dataset:

City	Policy Priority	Vegetation Type
Delhi	Implement Low Emissi...	High PM-Trapping Species (Broadleaf/Hairy/Waxy leaves like Plane, Linden, Elm) + Traffic-Tolerant Species (Sycamore, Holly)
Khulna	Implement Low Emissi...	High PM-Trapping Species (Broadleaf/Hairy/Waxy leaves like Plane, Linden, Elm)
Bhopal	Maintain current sta...	High PM-Trapping Species (Broadleaf/Hairy/Waxy leaves like Plane, Linden, Elm)
Chandigarh	Improve street tree ...	High PM-Trapping Species (Broadleaf/Hairy/Waxy leaves like Plane, Linden, Elm)
Sylhet	Maintain current sta...	High PM-Trapping Species (Broadleaf/Hairy/Waxy leaves like Plane, Linden, Elm)