

URBAN GREENS - An Initiative Towards Clean Air

Our national Capital New Delhi, which is now the most air polluted Capital in the WHOLE WORLD. The obvious solution towards a better air quality is **planting more trees**. This paper presents a solution in a more sustainable & smart way. It consists of an expert system based on Machine Learning which suggests the required tree percentage to make the aqi better, more sustainable practices based on the land availability in the particular districts of Delhi, ways to maintain a healthy tree, methods other than plantation to beat pollution. This proposed system is trained using data collected in our research & analysis.

Problems Identified	
Delhi’s deteriorating AQI	
Unequal Distribution of Trees	
Causes for sudden change in AQI- winter , diwali, humidity, fires	
No space for tree plantation- Industrial area	
Strictness by the government and abiding by the rules	

Tools & Technology	
Artificial Intelligence Pyswip prolog	
Machine Learning Xgboost Pandas Sklearn	
Google Earth Engine Google Earth Engine API Google Cloud SDK ESA world Cover V200	
To Display Map Leaflet openStreetMap	

Solutions	
Instead of tree plantation 1. Liquid Tree 2. Water Sprinkler	
If land is available for plantation 1. Trees for suggestion- peepal, Neem, Banyan, Saptaparni, Jamun, devdar, Champa 2. Congested Farming	
Large Scale strategies(By government) 1. Hydrogen power Plants 2. Artificial Rain 3. Smog Towers 4. Traffic Management Policies 5. Monitoring Construction Sites 6. Prohibition of burning of garbage in open areas 7. Water Sprinkling on roads 8. Mandatory Allocation of land to green cover in societies 9. Strictness by government	

Working	
Input	Required area from drop down menu.
Output Then the area will be scanned through our integrated Google earth engine API and fetches 4 observations as output :	Tree_cover_percentage - Present green Cover(forest cover) built_up - already occupied by buildings or roads Cropland - low dense green cover like farms Bare_area - empty land

We have a target AQI from 100-150. System will compare the required tree percentage to the present tree percentage and provide three types of outputs based on the conditions :	
The area has bad AQI but tree density is enough	System will suggest methods to maintain the trees like artificial rain , water sprinkling on roads and plants and other ways other than trees to improve the air quality. For example: Liquid trees adopted by Serbia.
The area has bad AQI & land available for plantation	System will provide effective ways of tree plantation like Miyawaki plantation. It will also suggest the best trees according to the major pollutant
The area has bad AQI but no land available for plantation	System will search for plantation land in nearby areas and also it will suggest ways to improve the air quality by implementing certain methods and technologies like hydrogen power plants, traffic management, tree maintenance , Liquid trees.
If the target area has required tree density.	If the target area already has the required tree density then the system will suggest methods to maintain the trees
After training our system we have reached an accuracy of 69% using xgboost model with test size data 20 %. Users will be able to interact through UI. The website will show a map of the selected district.	