



Air Pollution in Delhi, India

Campaigning for Sustainable Solutions

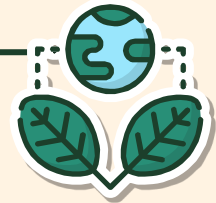


Table of contents



01

Introduction

02

The Problem

03

Context

04

Solution 1

05

Solution 2

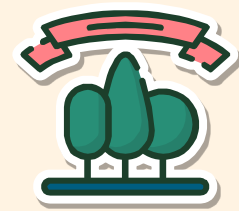
06

Conclusion





01



Introduction



Figure 1

Delhi, the world's most air polluted capital fights back

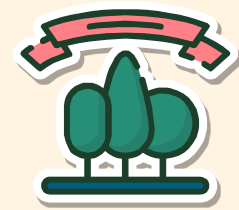


Note. Vinod and Chitranjali, November 25, 2020 <https://www.brookings.edu/articles/delhi-the-worlds-most-air-polluted-capital-fights-back/>

What is air pollution?



02



The Problem



Figure 3:

How Delhi became the most polluted city on Earth



**2 Million
Deaths**

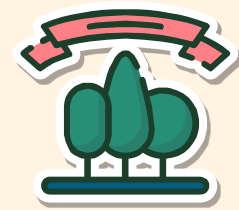
Note. Umair Irfan, Nov 25, 2017

<https://www.vox.com/energy-and-environment/2017/11/22/16666808/india-air-pollution-new-delhi>

Why Delhi?



03



Context



In India, **50%** of the workforce are farmers

Figure 6

The unrecognised urban farmers of Delhi are caught in conflict over land



Note. Farooq, A., 2023

<https://india.mongabay.com/2023/01/delhi-farmers-stare-the-uncertain-future/>

Stubble burning, a common practice

Figure 7

Stubble burning: Why it continues to smother north India



Note. Pathi, K. & Chhabra, A., 2020

<https://www.bbc.com/news/world-asia-india-54930380>

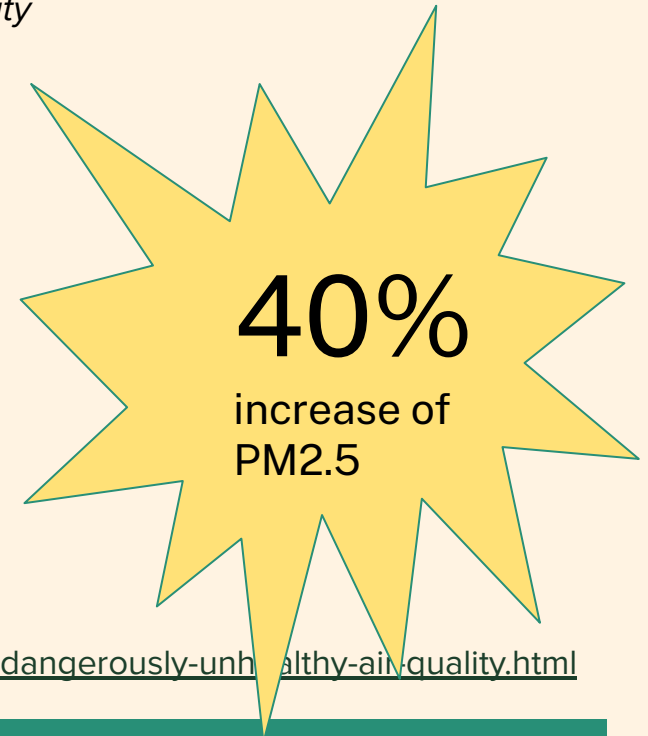
Figure 8:

Diwali festival leaves Delhi with dangerously unhealthy air quality



Note. CNBC. FRI, NOV 5 2023

<https://www.cnbc.com/2021/11/05/diwali-festival-leaves-delhi-with-dangerously-unhealthy-air-quality.html>



The problem with Diwali

Economic Context

Rapid Urbanization(Post-independence Era (after 1947) and Industrial Growth



Figure 13

Green Panel Shuts Dirty Fuel-Based Industries In Delhi, Suburbs Till November 11

Note. ndtv, November 09, 2019

<https://www.ndtv.com/delhi-news/anti-pollution-authority-board-shuts-dirty-fuel-industries-in-delhi-and-nearby-areas-till-monday-2129983>

Social Context

Anthropogenic Causes:

- **Causes outside the city (F1):**
 - Fossil fuel combustion.
 - Industrial Emission.
 - Farming-Crop burning.
- **Causes inside the city (F2):**
 - Indoor air pollution.
 - Transportation.
 - Open rubbish burning.
 - Construction and Demolition.



Figure 4

*Delhi Metro timings on August 15:
Check schedule, parking advisory*

Note. Gupta, S., 2023

<https://tinyurl.com/yhff4zms>

Environmental Context

Geographical Locations

1. Delhi is a **Basin**
2. Adjacent farms burn crop to prepare for wheat planting



Figure 11

Delhi's smog blamed on crop fires – but farmers say they have little choice

<https://www.theguardian.com/world/2019/nov/08/indian-farmers-have-no-choice-but-to-burn-stubble-and-break-the-law>



Figure 12

Geographic regions of South Asia

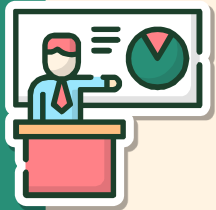
Note. Cristin McKnight Sethi, 11 July 2019

<https://www.khanacademy.org/humanities/art-asia/south-asia/south-asia-intro/a/geographic-regions-of-south-asia>



SOLUTION

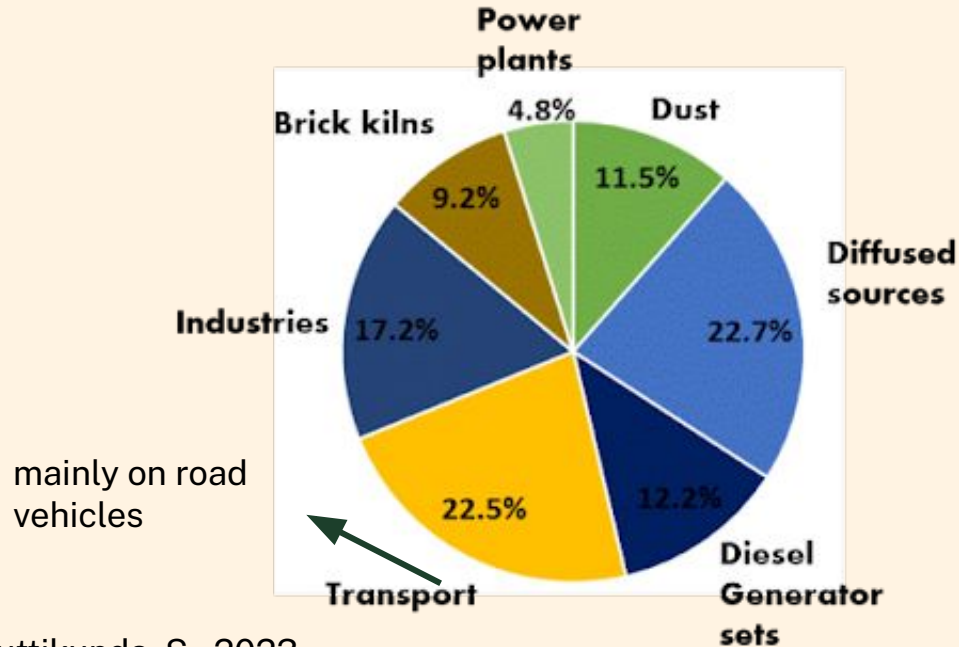
Encouraging people for a
change in public
transport



Raising awareness

Figure 3

Air Pollution in Delhi - Winter Time Highs and Blame Games



mainly on road vehicles



Note. Guttikunda, S., 2023

<https://urbanemissions.blogspot.com/2012/11/pollution-in-delhi-winter-time-highs.html>

A wrong “good intention”

Figure 2

New roads in Delhi: Project worth Rs 13.58 cr gets Deputy CM's approval, 17 roads to get a facelift



Note. TN City Desk, 2022

<https://www.timesnownews.com/delhi/new-roads-in-delhi-project-worth-rs-13-58-cr-gets-deputy-cms-approval-17-roads-to-get-a-facelift-article-92494606>

Delhi's metro



- Low capacity of trains
- Low frequency of trains
- Too crowded and less convenient
- Other ways of transport preferred



Figure 1:

Breathless due to the crowd, rue commuters of Delhi metro

Note. Mishra, A., 2022

<https://www.hindustantimes.com/cities/delhi-news/breathless-due-to-the-crowd-rue-commuters-of-delhi-metro-101669627933549.html>

Figure 4

Delhi Metro timings on August 15: Check schedule, parking advisory

**High-quality
metro**



**Accessibility,
efficiency,
safety,
communication,
digitalization**



Note. Gupta, S., 2023

<https://tinyurl.com/yhff4zms>



Congestion pricing?



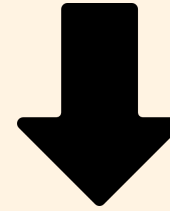
Figure 1:
Traffic Nightmare On Delhi-Gurgaon Expressway Due To Crane Breakdown

Note. India News, 2022

<https://www.ndtv.com/india-news/traffic-nightmare-for-gurgaon-delhi-commuters-due-to-crane-breakdown-2874460>



Tolls



Traffic



SOLUTION

Spreading awareness to
better alternatives to
stubble burning





The PUSA Decomposer



Figure 2:
Delhi Chief Minister Arvind Kejriwal sprays paddy straw with
microbial solution

Note. Mongabay, 2022

[Pusa Decomposer holds promise against crop residue burning](https://www.mongabay.com)
([mongabay.com](https://www.mongabay.com))

- A spray that kills crops instead of burning them
- Developed by the Indian Agricultural Research Institute (IARI)
- Started being used in 2021

What is the Pusa Decomposer

How to better implement this solution

1. Advocate for more progressive farming
2. Provide more awareness/education to the population
3. Diversifying the educated population

Work Cited

Guardian News and Media. (2019a, November 8). *Delhi's smog blamed on crop fires – but farmers say they have little choice*. The Guardian.
<https://www.theguardian.com/world/2019/nov/08/indian-farmers-have-no-choice-but-to-burn-stubble-and-break-the-law>

Guardian News and Media. (2019b, November 8). *Delhi's smog blamed on crop fires – but farmers say they have little choice*. The Guardian.
<https://www.theguardian.com/world/2019/nov/08/indian-farmers-have-no-choice-but-to-burn-stubble-and-break-the-law>

Figure 4
Delhi Metro timings on August 15: Check schedule, parking advisory

Figure 1:
Traffic Nightmare On Delhi-Gurgaon Expressway Due To Crane Breakdown Note. India News, 2022
<https://www.ndtv.com/india-news/traffic-nightmare-for-gurgaon-delhi-com-muters-due-to-crane-breakdown-2874460>

India, P. T. of. (2019, November 9). *Green panel shuts dirty fuel-based industries in Delhi, suburbs till November 11*. NDTV.com.
<https://www.ndtv.com/delhi-news/anti-pollution-authority-board-shuts-dirty-fuel-industries-in-delhi-and-nearby-areas-till-monday-2129983>

Note. Farooq, A., 2023
<https://india.mongabay.com/2023/01/delhi-farmers-starve-the-uncertain-future/>

Note. CNBC. FRI, NOV 5 2023
<https://www.cnbc.com/2021/11/05/diwali-festival-leaves-delhi-with-dangerously-unhealthy-air-quality.html>

India News, 2022
<https://www.ndtv.com/india-news/traffic-nightmare-for-gurgaon-delhi-com-muters-due-to-crane-breakdown-2874460>