

PROBLEM STATEMENTS

I. Project: Air Quality Impacts of Waste Burning in New Delhi

Problem Statement:

Address the critical issue of waste burning contributing to poor air quality in New Delhi. Despite the known adverse effects, unregulated waste burning persists, emitting harmful pollutants. The project aims to understand the extent of the problem, identify contributing factors, and propose data-driven strategies to mitigate its impact on air quality.

Project Objectives:

1. Quantify the Extent of Waste Burning: Analyze satellite imagery and remote sensing data to identify and quantify instances of waste burning in targeted urban areas.
2. Identify Contributing Factors: Explore socio-economic and demographic data to understand factors contributing to the prevalence of waste burning.
3. Assess Air Quality Impact: Utilize air quality data to assess the correlation between waste burning incidents and the concentration of air pollutants.

Expected Deliverables:

1. Waste Burning Heatmap: A spatial representation highlighting areas with high waste burning incidents based on satellite imagery and remote sensing.
2. Factor Analysis Report: Insights into socio-economic and demographic factors influencing waste burning patterns.
3. Air Quality Assessment Report: Analysis of the impact of waste burning on air quality, including pollutant concentrations and their spatial distribution.

Potential Data Sources:

- Air Quality Data ([CPCB](#))
- Earth Data ([NASA](#))
- Copernicus Data Space ([ESA](#))

Additionally, you can consider using platforms like Data.gov.in, [NDAP](#), Kaggle, GitHub and other open data repositories (such as [here](#) and [here](#)) for supplementary datasets.

Please feel free to utilize any other relevant data sources, but kindly provide the necessary citations to avoid plagiarism or copyright issues.

II. Project: Evaluating the Impact of Urban Green Spaces on Heat-Related Illnesses in Bangalore

Problem Statement:

The rapid urbanization of Bangalore has led to a reduction in green spaces, contributing to the urban heat island effect. This project aims to analyze and optimize urban green spaces to mitigate the impact of heat in the city.

Project Objectives:

- Green Space Utilization Analysis: Analyze satellite imagery and land use data to assess the current distribution and utilization of urban green spaces in Bangalore.
- Heat Mapping and Correlation Study: Investigate the correlation between the characteristics of green spaces and localized heat patterns, considering factors such as vegetation density and land surface temperatures.

Deliverables:

- Green Space Utilization Map: A visual representation of the current state of urban green spaces in Bangalore based on satellite imagery and land use data.
- Heat Correlation Report: Analysis of the relationship between green space characteristics and localized heat patterns, providing insights for heat mitigation strategies.

Potential Data Sources:

1. Satellite Imagery:
 - a. [ISRO Remote Sensing Data](#)
 - b. [NASA Landsat](#)
2. Weather Data ([IMD](#))
3. Bangalore [OpenStreetMap](#) Data for detailed information on the geography and layout of Bangalore, including existing green spaces.

Additionally, you can consider using platforms like Data.gov.in, [NDAP](#), Kaggle, GitHub and other open data repositories (such as [here](#) and [here](#)) for supplementary datasets.

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III. Project: Climate Change and Agricultural Productivity in Punjab

Problem Statement:

Climate change poses a significant threat to agricultural productivity in Punjab. This project aims to examine the specific impact of climate change on key crops, analyzing temperature and precipitation changes, identifying adaptive farming practices, and formulating policy recommendations for sustainable agriculture in the region.

Project Objectives:

- Climate Data Analysis: Collect and analyze historical climate data, focusing on temperature and precipitation patterns in Punjab.
- Crop Yield Records Examination: Investigate crop yield records for major crops in Punjab to identify trends and variations in productivity.

Deliverables:

- Climate Impact Analysis Report: Detailed analysis of how temperature and precipitation changes have influenced the yield of major crops in Punjab.
- Adaptive Farming Practices Document: Identification and documentation of adaptive farming practices that farmers can implement to mitigate the negative effects of climate change.

Datasets:

1. Climate data specific to Punjab
2. Crop yield records for major crops
3. Socio-economic indicators related to agriculture in Punjab

Potential Data Sources:

1. Crop Yield Data ([ICRISAT](#))
2. Earth Data ([NASA](#))
3. Copernicus Data Space ([ESA](#))
4. Weather Data
 - a. [IMD](#)
 - b. [NASA](#)
5. Rainfall Data ([IMD](#))

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IV. Project: Climate Change and Nutritional Challenges in Tribal Communities of Jharkhand

Problem Statement:

Climate change is affecting the nutritional well-being of tribal communities in Jharkhand. This project aims to examine the impact of climate change on nutritional challenges by analyzing climate data, agricultural productivity, and nutritional health indicators. The goal is to understand how climate change influences the availability of nutritious food, identify correlations with

malnutrition rates, and propose sustainable agricultural practices to improve nutrition in these communities.

Project Objectives:

- Climate Data Analysis: Collect and analyze climate data specific to tribal regions of Jharkhand, focusing on temperature, precipitation, and other relevant climatic factors.
- Agricultural Productivity Assessment: Investigate agricultural productivity data, emphasizing key crops and their yields in tribal areas.
- Nutritional Health Indicators Examination: Analyze nutritional health indicators, including malnutrition rates, to understand the current nutritional status of tribal communities.

Deliverables:

- Climate Impact on Nutrition Report: Comprehensive analysis of how climate change has influenced the availability of nutritious food in tribal regions of Jharkhand.
- Correlation Between Climate and Malnutrition Document: Documentation of correlations between climatic factors and malnutrition rates in tribal communities.
- Recommendations for Sustainable Agriculture and Nutrition: A set of recommendations outlining sustainable agricultural practices tailored for tribal areas to improve nutrition despite the challenges posed by climate change.

Potential Data Sources:

1. Weather Data
 - a. [IMD](#)
 - b. [NASA](#)
2. Rainfall Data ([IMD](#))
3. Health Data: ([NFHS-5](#))

Additionally, you can consider using platforms like Data.gov.in, [NDAP](#), Kaggle, GitHub and other open data repositories (such as [here](#) and [here](#)) for supplementary datasets.

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V. Project: Assessing the Impact of Cyclone-Induced Flooding on Waterborne Diseases in Coastal Odisha

Problem Statement:

Cyclone-induced flooding in coastal areas of Odisha poses a significant risk of waterborne diseases. This project aims to investigate the link between cyclone characteristics, water quality, and the prevalence of waterborne diseases. The analysis will focus on understanding how different cyclone features affect the risk of waterborne diseases and identifying patterns of disease outbreaks following cyclone events.

Project Objectives:

- Cyclone Data Analysis: Collect and analyze cyclone data, including characteristics such as intensity, duration, and affected areas in coastal Odisha, and the changes in these patterns as a result of climate change.
- Water Quality Records Examination: Investigate water quality records before, during, and after cyclone events, focusing on parameters relevant to waterborne diseases.
- Health Correlation: Identify correlations between different cyclone characteristics, water quality changes, and the prevalence of waterborne diseases.

Deliverables:

- Assessment of Cyclone Pattern Changes: Report on how cyclone patterns are changing with climate change, including implications for coastal regions.
- Cyclone Impact Analysis Report: Detailed analysis of how different cyclone characteristics influence the risk of waterborne diseases in coastal Odisha.

Potential Data Sources:

1. Health Data: ([NFHS-5](#))
2. Weather Data
 - [IMD](#)
 - [NASA](#)
3. Cyclone Data ([IMD](#))
4. Satellite Imagery:
 - [ISRO Remote Sensing Data](#)
 - [NASA Landsat](#)

Additionally, you can consider using platforms like Data.gov.in, [NDAP](#), Kaggle, GitHub and other open data repositories (such as [here](#) and [here](#)) for supplementary datasets.

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