INTERNATIONAL INSTITUTE OF INFORMATION TECHNOLOGY
HYDERABAD

SINGRAULI COAL MINE

LULC ANALYSIS

VINIT MEHTA – 2022111001

Contents

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Problem Statement

This study analyzes land cover and settlement changes around the Singrauli coal mine in India from 2000 onwards, using satellite imagery analysis within a 15km radius. By employing data acquisition, preprocessing, land cover classification, and spatial analysis techniques, significant shifts in land cover composition and notable settlement expansion have been identified. These findings offer insights into the broader environmental and socio-economic impacts of coal mining activities in the region, emphasizing the importance of adopting sustainable management strategies.

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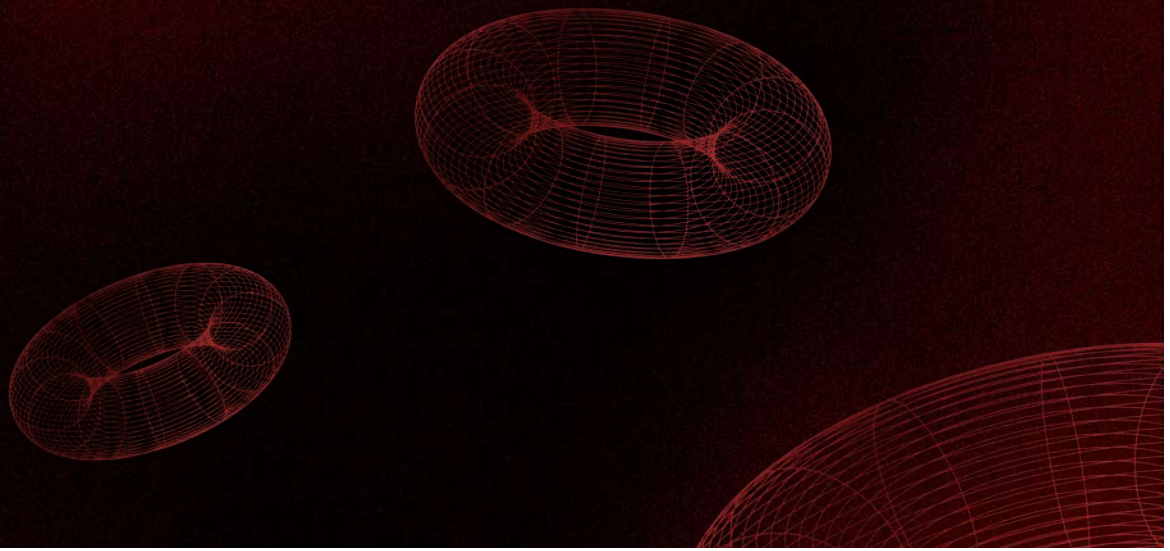
Data Processing

How I acquired and processed the data.

Searching for the coal mine to study

Using Google Search



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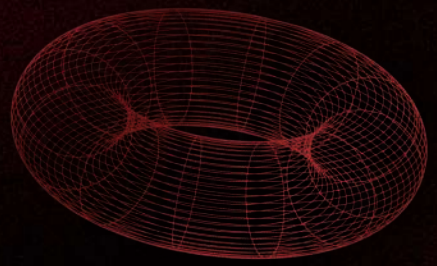
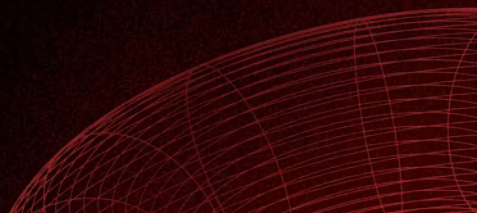
Finding Dataset
Used LandSat 7 and 8 data





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Data Processing

How I acquired and processed the data.

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Using Google Search

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Finding Dataset
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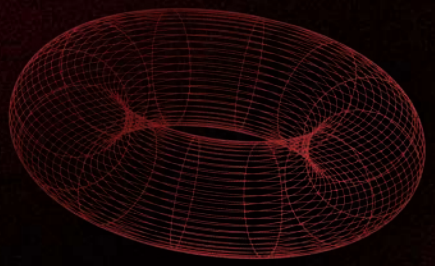
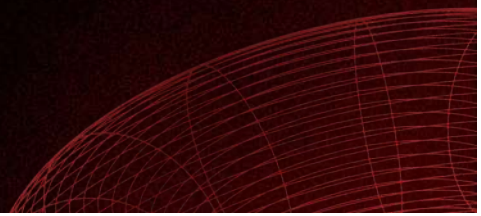
Finding ROI
Used Google Maps and 15km radius





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Data Processing

How I acquired and processed the data.

Searching for the coal mine to study
Using Google Search

→

Finding Dataset
Used LandSat 7 and 8 data

→

Finding ROI
Used Google Maps and 15km radius

↓

Selection of Bands
True Color Composite

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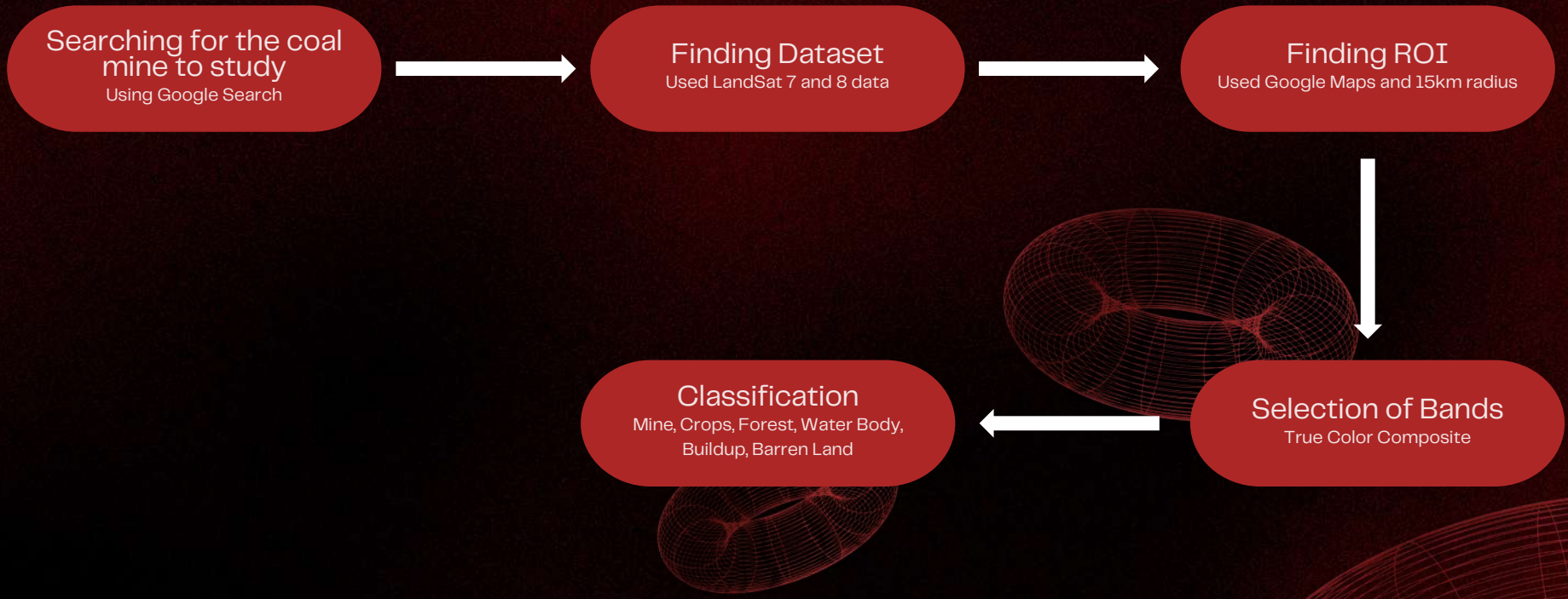
Data Processing

How I acquired and processed the data.



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Data Processing

How I acquired and processed the data.

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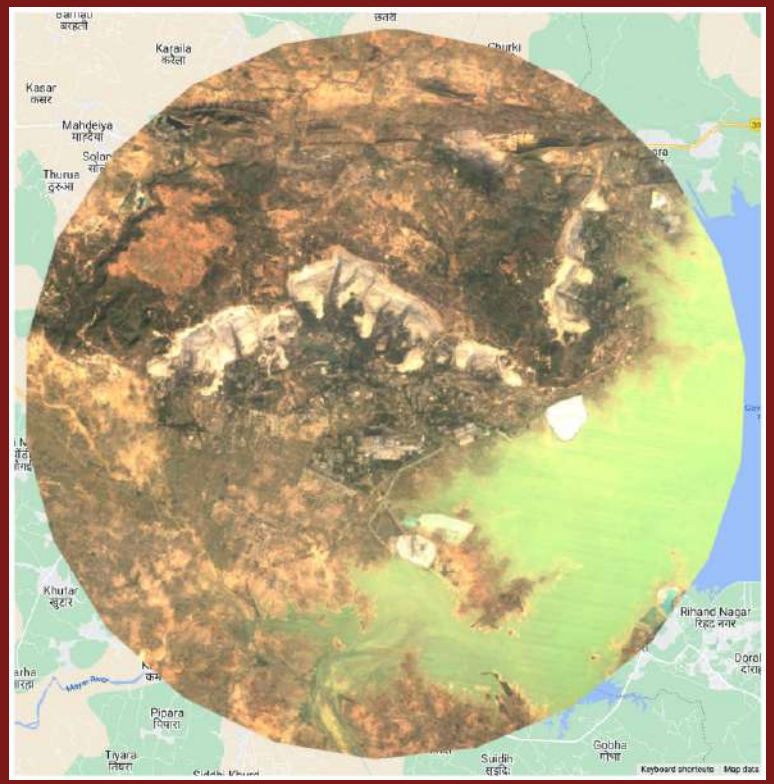
Outputs

Before and After Classification



2000–2004

True Color Composite Map before Classification. LANDSAT 7

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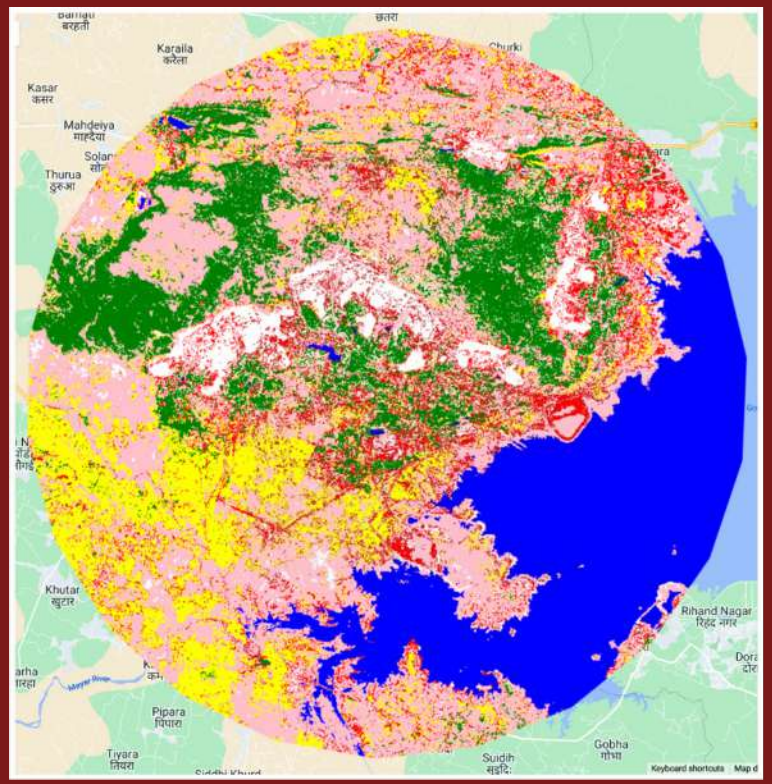
Outputs

Before and After Classification



2000–2004

Classified Map

Color	Name	Class	HexValue
White	coal_mine	1	#FFFFFF
Blue	water_body	2	#0000FF
Red	build_up	3	#FF0000
Green	vegetation	4	#00FF00
Yellow	crop_land	5	#FFFF00
Pink	barren_land	6	#F04CFF

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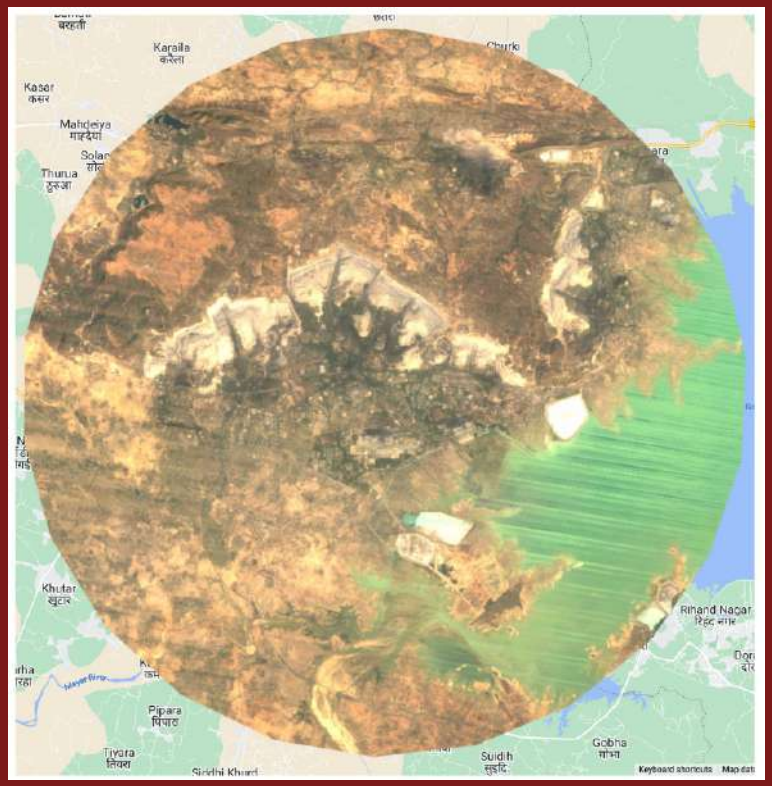
Outputs

Before and After Classification



2005-2009

True Color Composite Map before Classification. LANDSAT 7

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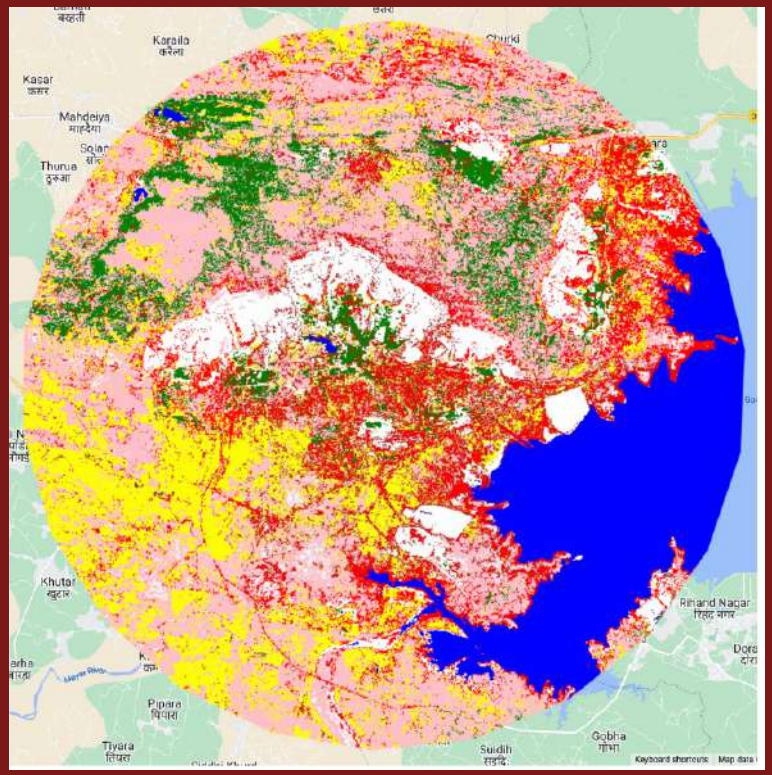
Outputs

Before and After Classification



2005-2009

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White	coal_mine	1	#FFFFFF
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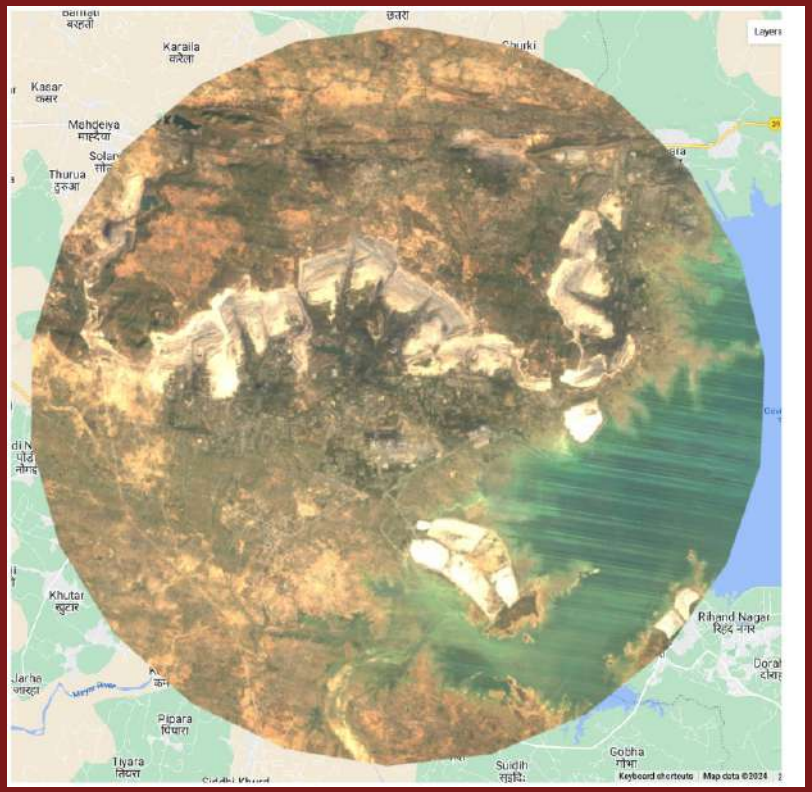
Outputs

Before and After Classification



2010–2014

True Color Composite Map before Classification. LANDSAT 7

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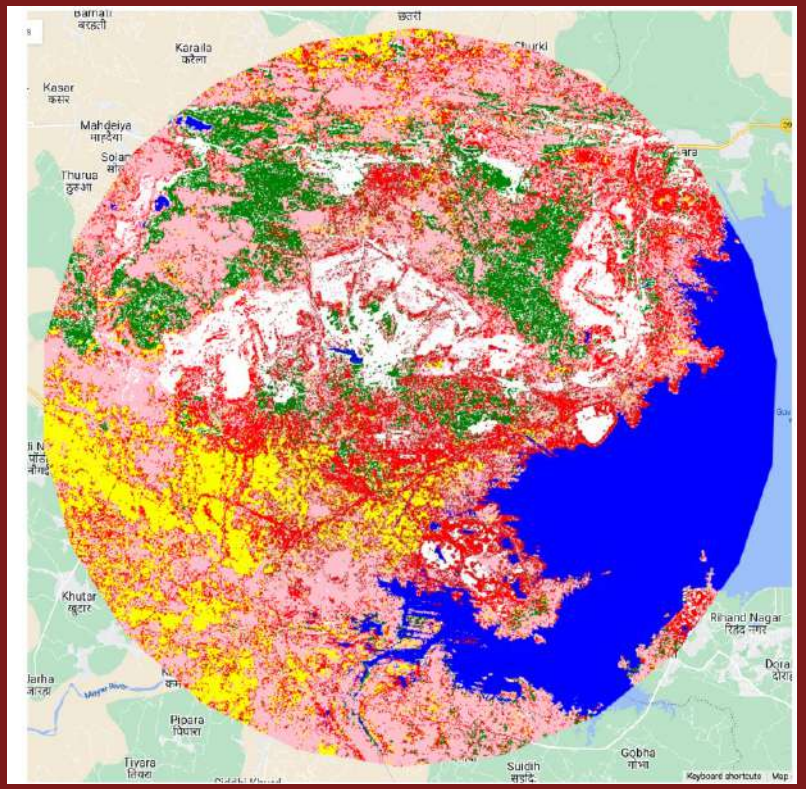
Outputs

Before and After Classification



2010–2014

Classified Map

Color	Name	Class	HexValue
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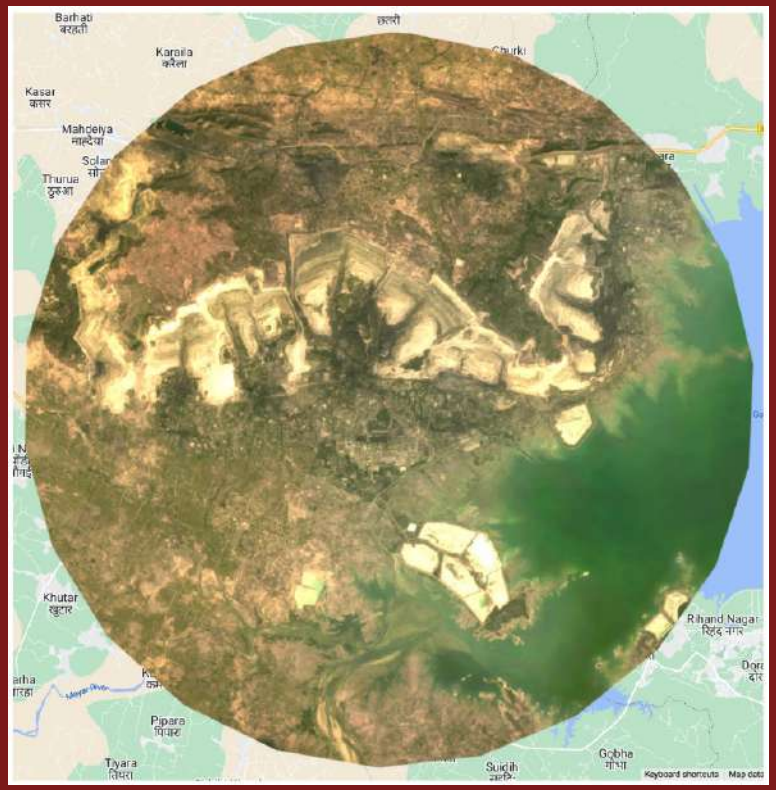
Outputs

Before and After Classification



2015-2019

True Color Composite Map before Classification. LANDSAT 8

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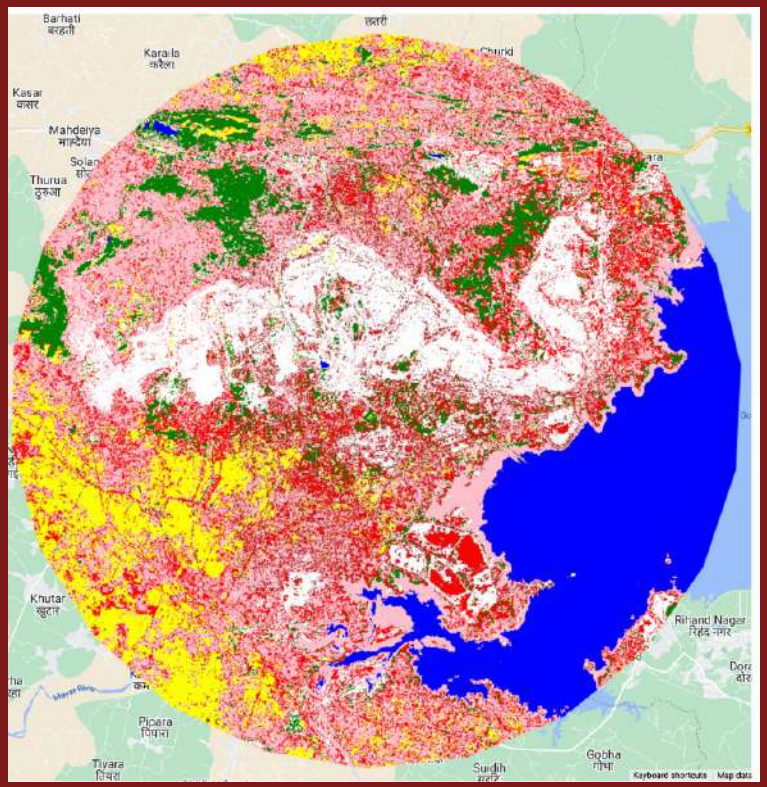
Outputs

Before and After Classification



2015-2019

Classified Map

Color	Name	Class	HexValue
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Pink	barren_land	6	#F04CFF

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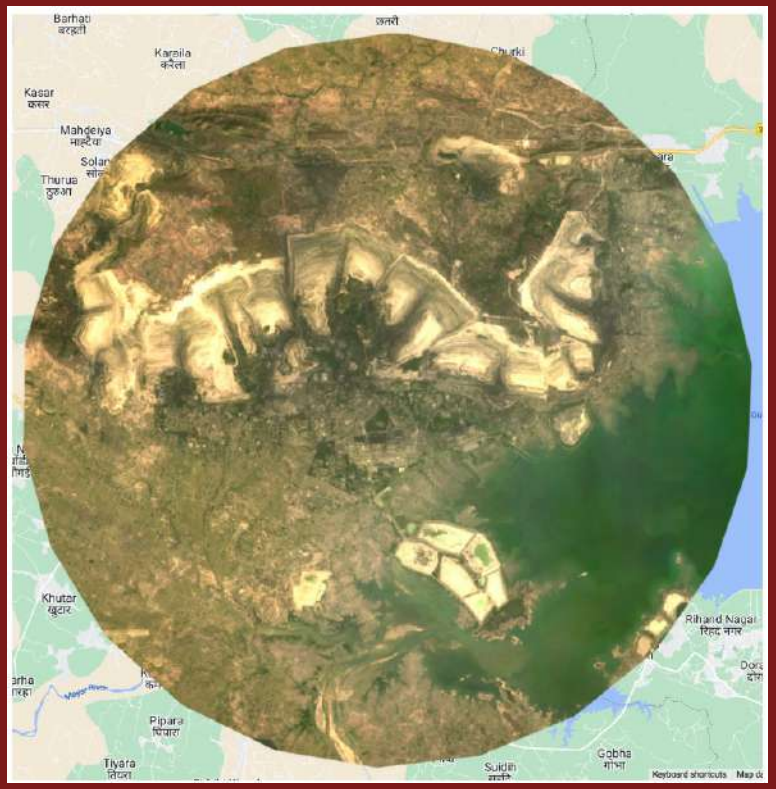
Outputs

Before and After Classification



2020-2023

True Color Composite Map before Classification. LANDSAT 8

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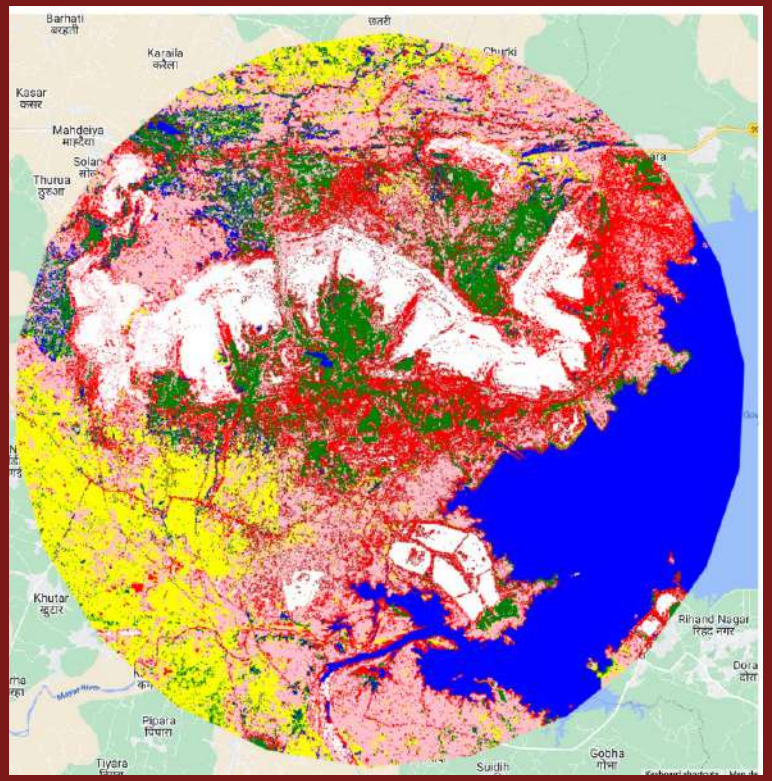
Outputs

Before and After Classification



2020-2023

Classified Map

Color	Name	Class	HexValue
White	coal_mine	1	#FFFFFF
Blue	water_body	2	#0000FF
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Green	vegetation	4	#00FF00
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Difficulties Faced

DIFFICULTY # 1

Limited Availability of dataset.

DIFFICULTY # 2

Insufficient Region of Interest.

DIFFICULTY # 3

Classification Challenges.

DIFFICULTY # 4

Verification Challenges.

DIFFICULTY # 5

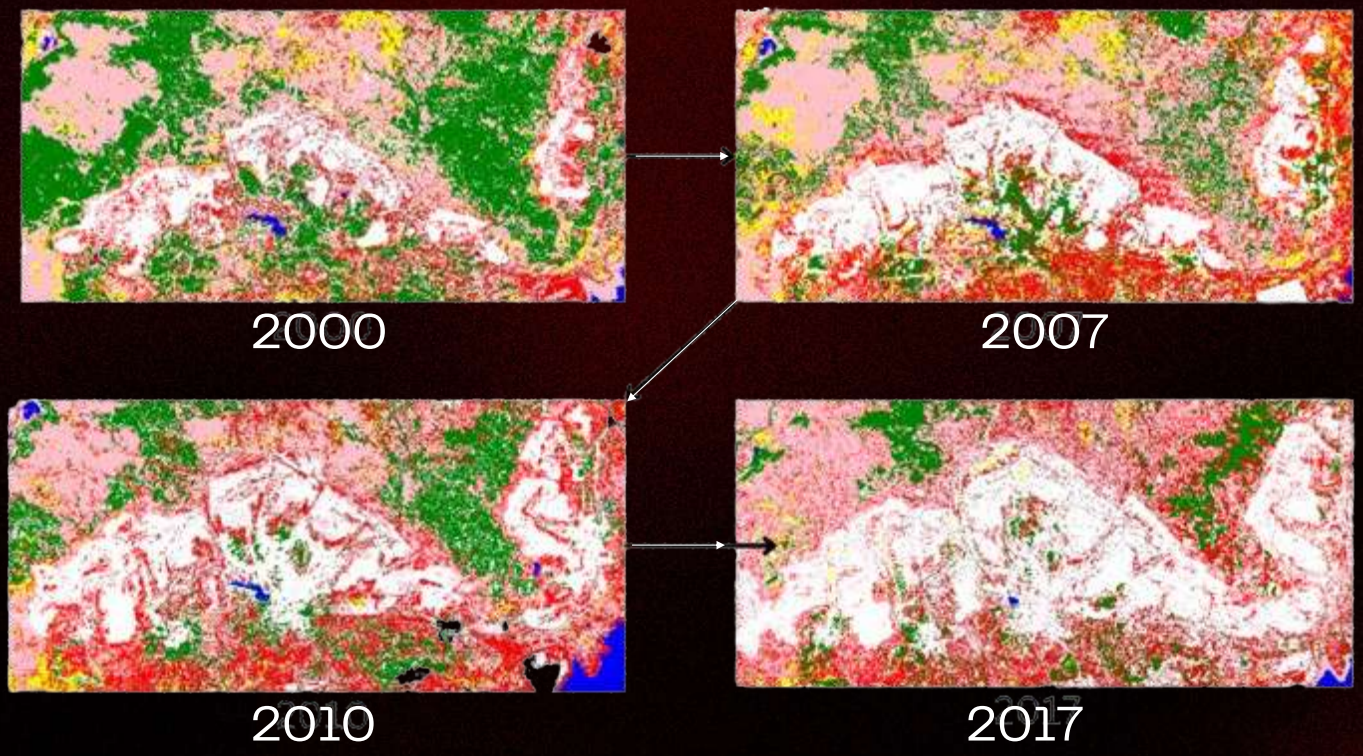
Data Gathering.

DIFFICULTY # 6

Data Quality Issues.

Analysis & Inference

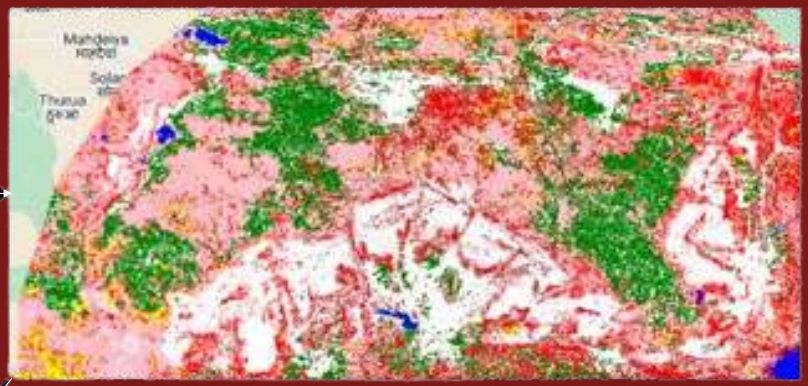
Growth of Mine



*Mine is represented by white color

Decrease in Forest Cover

2002

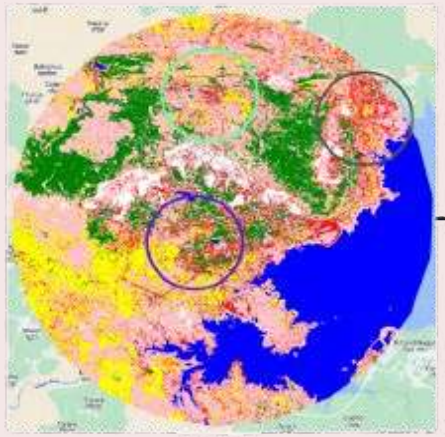


2012

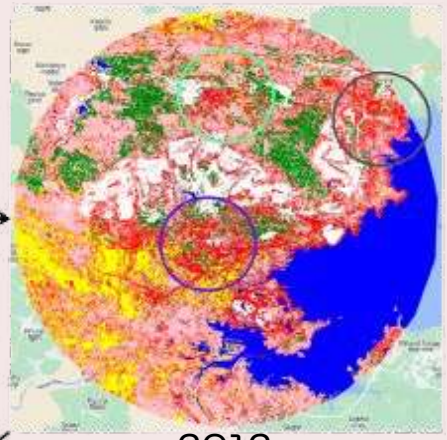
2022

*Forest is represented by green color

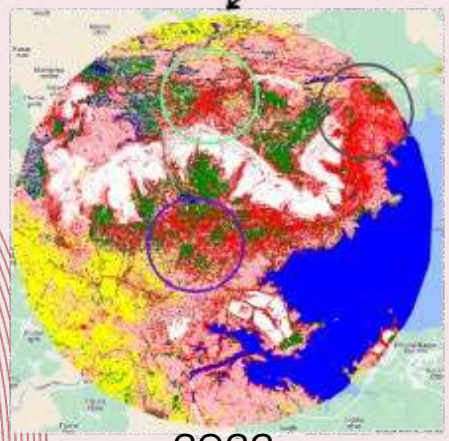
Growth of Settlements



2002



2012



2022

There has been increase in the

15km region around the coal mine

from 11.72 km^2 in 2001 to 40.43

km^2 in 2020 which is an increase

of 28.71 km^2 ≡ 244.96% increase

in the settlement/build-up area.

*Settlement is represented by red color

Bibliography

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Impact of coal mining on LULC in Singrauli Coalfield

Rizwan Ahmad, Akram Javed and Imran Khan in Global Scientific Journals 9.11 (2021), pp. 2253

Google Earth Engine

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Thank You!

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