Mapping India in seconds, for one and all with *BharatViz*

Saket Choudhary
Assistant Professor, Koita Centre for Digital Health
IIT Bombay

IndiaFOSS 2026

@saketkc

Checkout Aniruddha and Mukesh's talk tomorrow !

30 MIN | TALK | 27 Sep | Hall 1

10:45 AM

INDIA FOSS 2026

26TH - 27TH SEPTEMBER 2026
BENGALURU

GENERAL TRACK | TALK

Seqout: search engine for the world's genomic data



Aniruddha Mukherjee
Graduate student, Indian Institute of Technology Bombay



Mukesh Reddy
Undergraduate Student, NIT Warangal

FOSSUNITED.ORG/INDIAFOSS

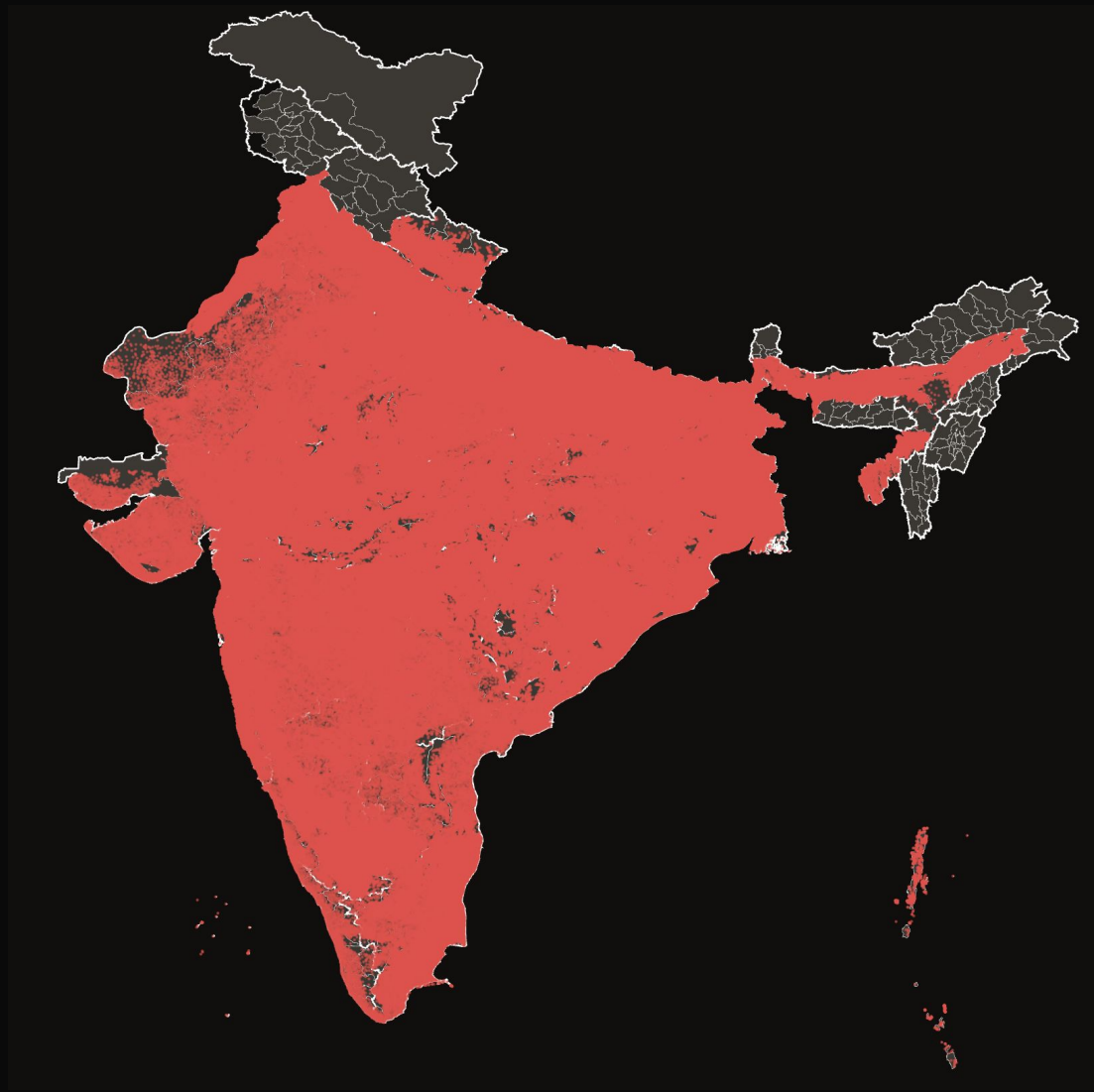
FOSS UNITED

India has diverse data!



… and diverse boundaries!

36 states and UTs.
750+ districts.
6500+ blocks.
600k+ villages.



… so, what is the problem?

If you wanted to map *literacy* in India right now you'd need:

- a GIS degree
- a *functional* shapefile
- and a weekend.

The Hacker way

- a desktop install
- and hours of manual name-matching!

The Windows way

- a browser
- or a LLM
- and ₹₹₹₹!

LLMs are all you need!

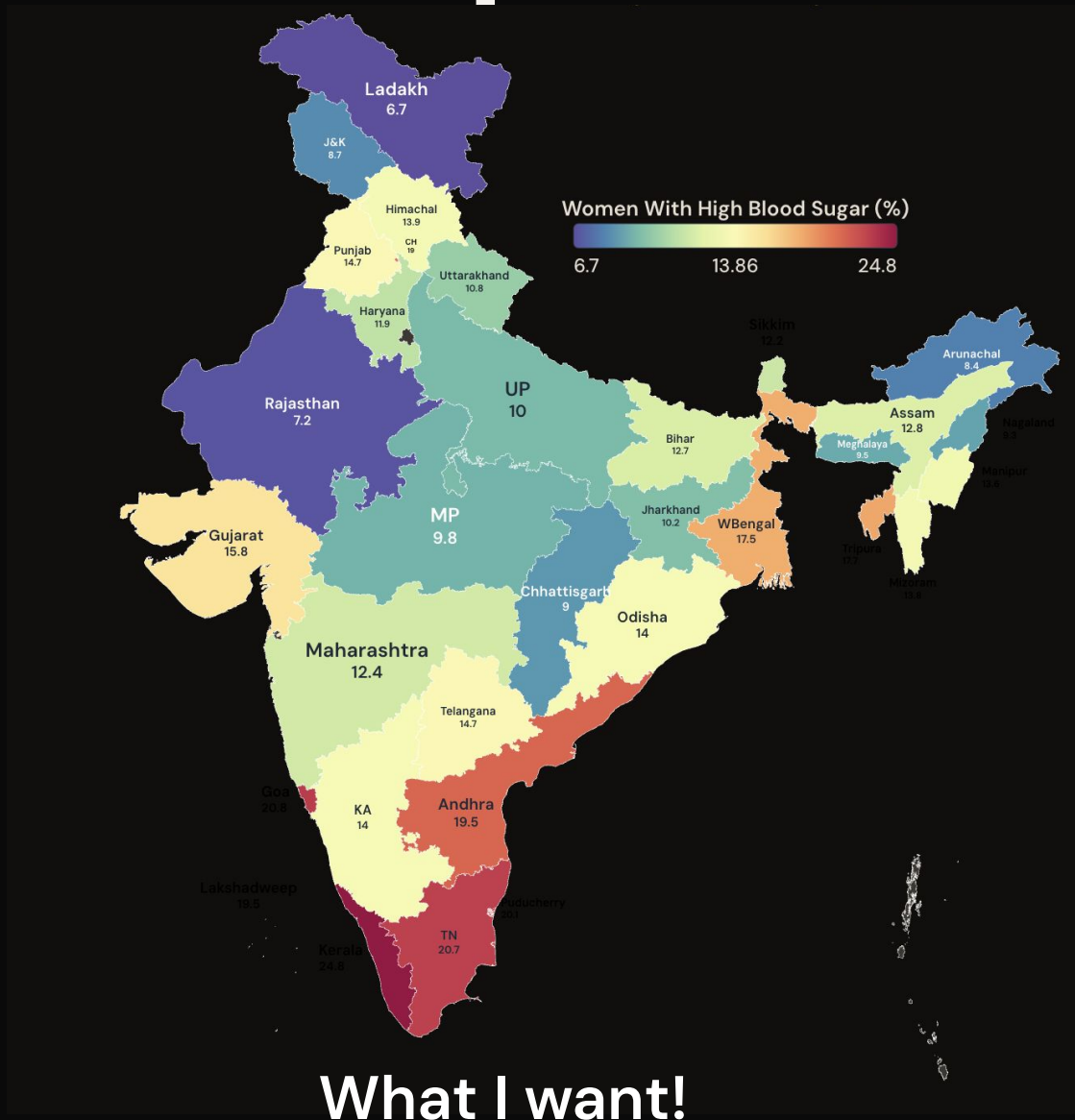
Spreadsheets *don't* show patterns

D

states_17_women_diabetes

state	Women With High Blood Sugar (%)
Andaman & Nicobar Islands	17.5
Andhra Pradesh	19.5
Arunachal Pradesh	8.4
Assam	12.8
Bihar	12.7
Chandigarh	19.0
Chhattisgarh	9.0
Dadra & Nagar Haveli & Daman & Diu	13.6
Goa	20.8
Gujarat	15.8
Haryana	11.9
Himachal Pradesh	13.9
Jammu & Kashmir	8.7
Jharkhand	10.2
Karnataka	14.0
Kerala	24.8
Ladakh	6.7

What I get!



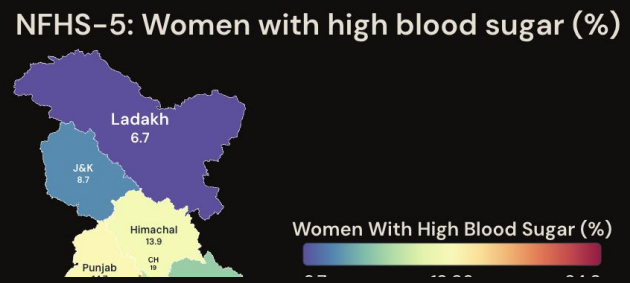
What I want!

Public data deserves public and open-source tools.

So we built BharatViz – to make mapping easy, interactive and intuitive for *one and all*!

Upload a CSV → Get a map hassle-free

Upload Your Data



Export

PNG | SVG | PDF | Copy | GeoJSON | Copy URL | GeoParquet | Cite

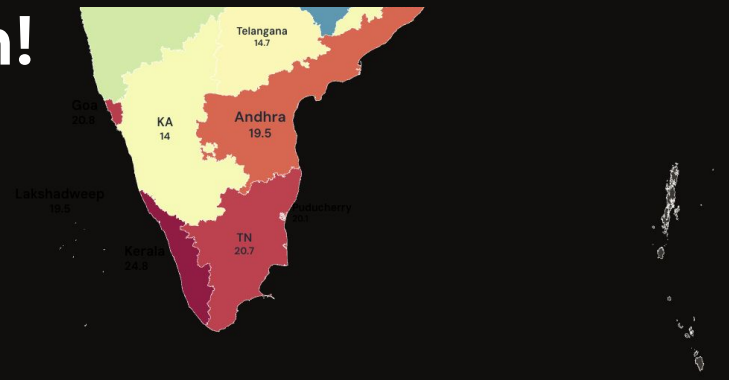
Or load from URL

Paste a Google Sheets link (sheet must be publicly viewable - see template) or a direct URL to CSV, TSV, or gzipped files. Download template

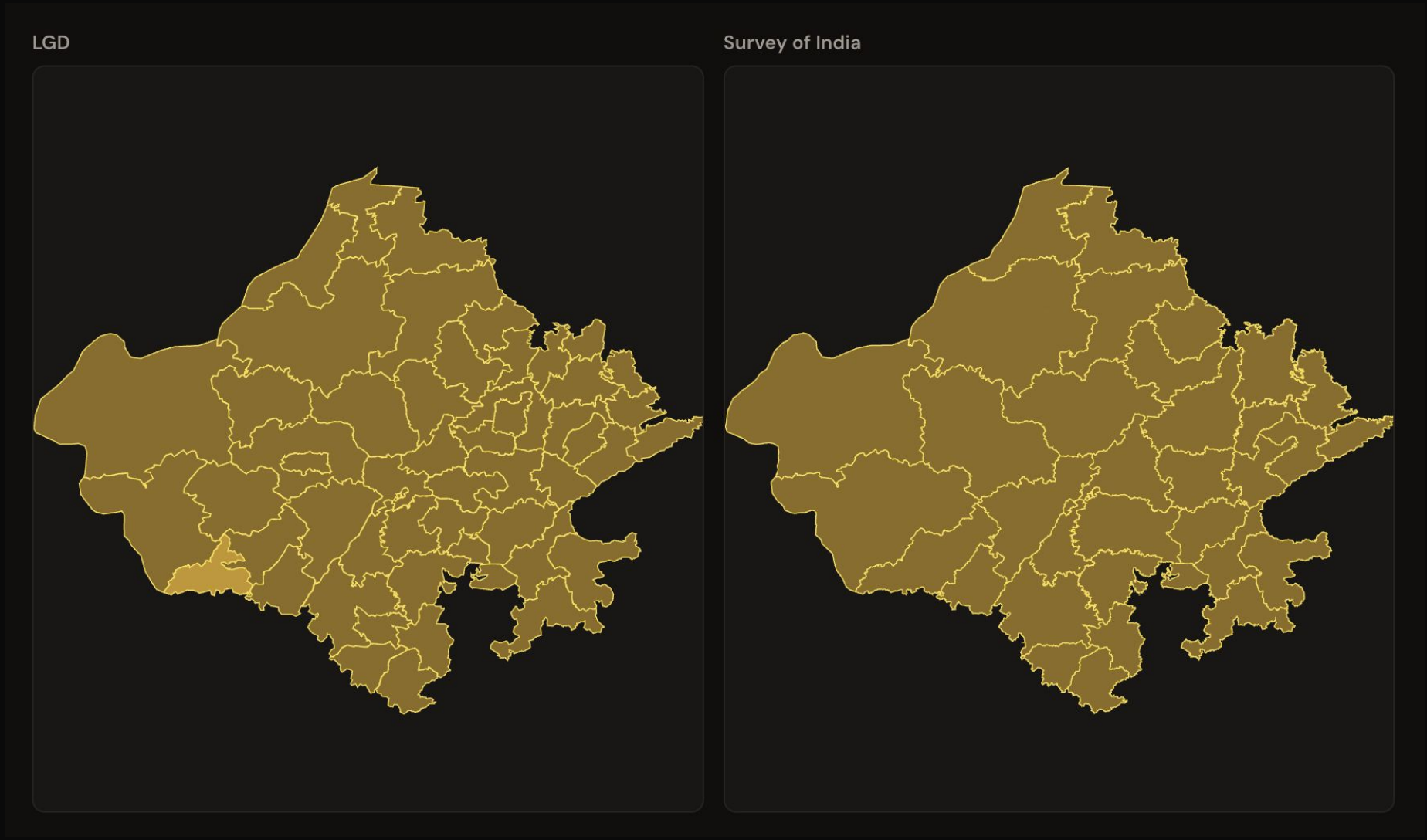
https://docs.google.com/... or https://exampl

Load from URL

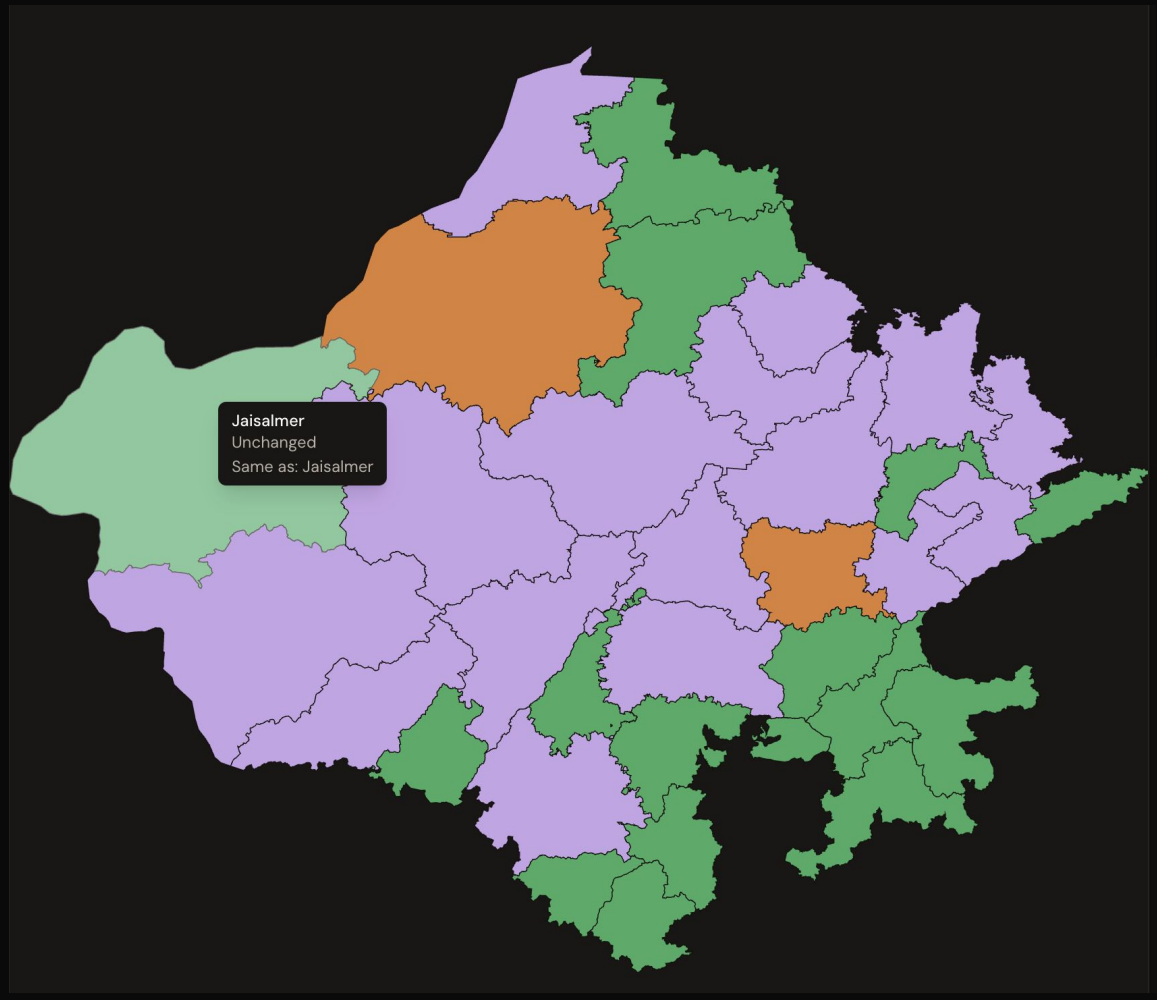
No watermarks, no login!



But map boundaries and names keep *evolving*!



BharatViz allows you to visualise these changes



SOURCES

1st LGD

2nd Survey of India

+ Add source

VIEW MODE

Diff | Overlay | Side by side

Comparing **LGD** (baseline) against **Survey of India**.

Unchanged 15 · Modified 2 · Split 6 · Merged 27 · Added 0 · Removed 0

15 unchanged districts not shown below · computed in 4.7s

District	State	Change	Overlap
Jodhpur	Rajasthan	Merged	7%
Jaipur	Rajasthan	Split	10%
Tonk	Rajasthan	Split	10%
Bikaner	Rajasthan	Split	12%
Ajmer	Rajasthan	Split	14%
Jhunjhunun	Rajasthan	Split	16%
Alwar	Rajasthan	Split	17%
Pali	Rajasthan	Split	17%

BharatViz harmonises name changes across years



1951

https://bharatviz.org/evolution



1951

API backend for programmatic queries

District Evolution
Trace how districts changed across census years (1951-2011)

- GET `/api/v1/district-evolution` Trace a district across census years
- GET `/api/v1/district-evolution/data.csv` Download deduplicated transition table

Maps
Generate choropleth maps as PNG / SVG / PDF

- POST `/api/v1/states/map` Generate state-level choropleth map
- POST `/api/v1/districts/map` Generate all-India district choropleth map
- POST `/api/v1/districts/state-districts/map` Generate single-state district choropleth map

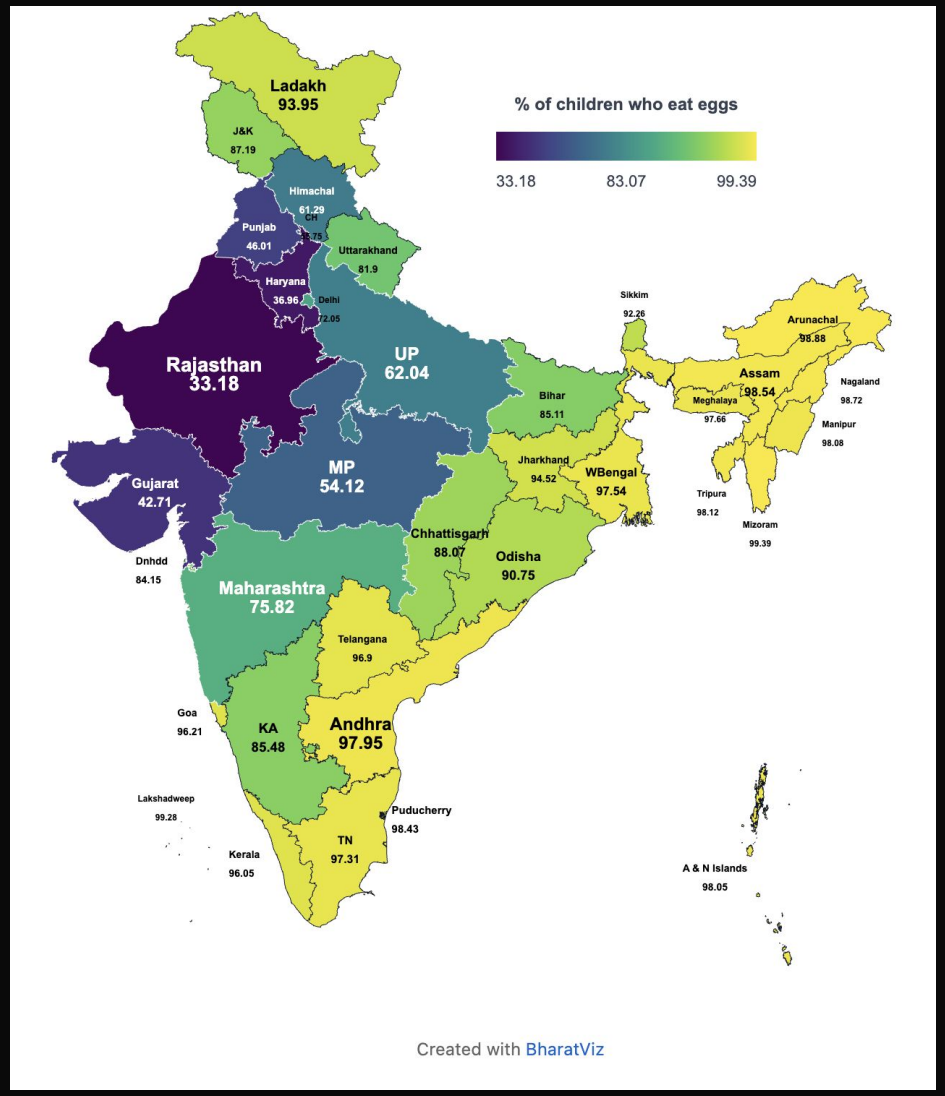
Pincodes
Pincode-level maps for 38 Indian states (~19,000 pincodes)

- GET `/api/v1/pincodes/states` List states with pincode data
- GET `/api/v1/pincodes/states/{state}/pincodes` List pincodes for a state
- POST `/api/v1/pincodes/map` Generate pincode-level choropleth map

Embed BharatViz maps in your html

```
<iframe

src="https://bharatviz.saketlab.org/api/v1/em
bed?dataUrl=https%3A%2F%2Fbharatviz.saketlab.
org%2Fnfhs5_protein_consumption_eggs.csv&colo
rScale=viridis&title=Protein%20consumption%20
in%20India"
  width="800"
  height="600"
  frameborder="0"
  sandbox="allow-scripts allow-same-origin"
  style="border: none; max-width: 100%;">
</iframe>
```



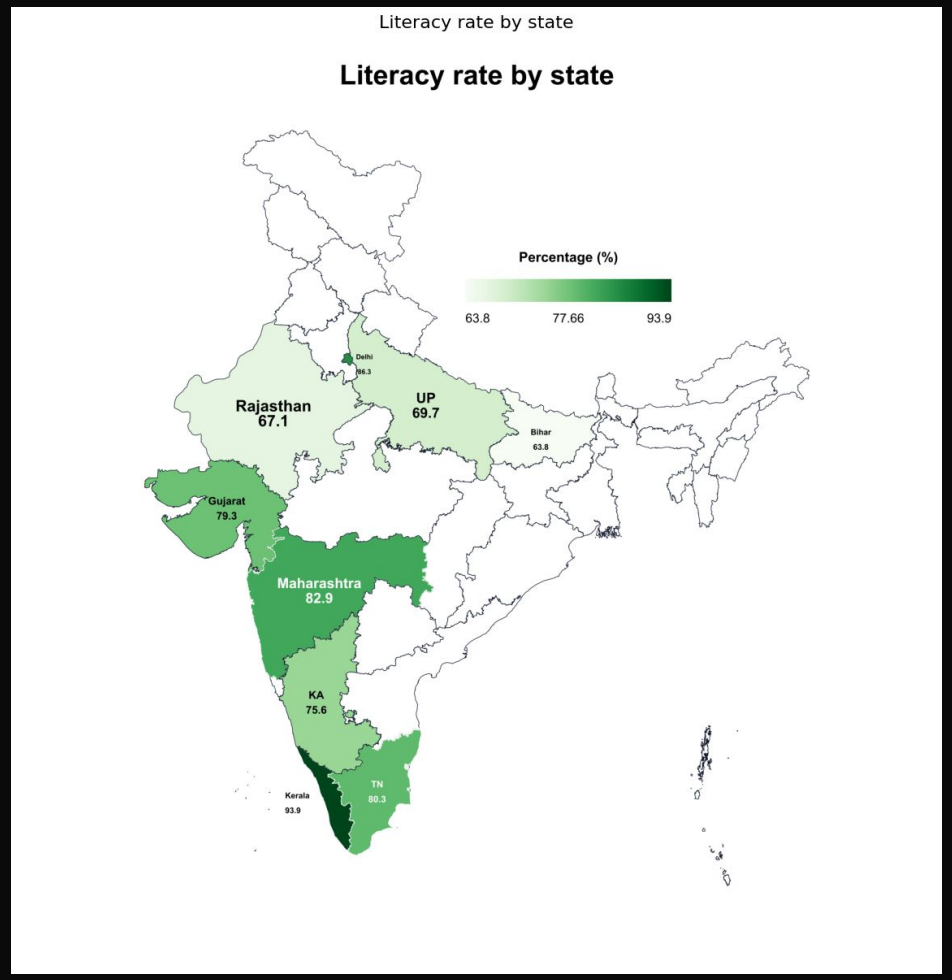
https://bharatviz.org/embed-demo

Use BharatViz maps in python

```python
from bharatviz import BharatViz

# Create data from a simple dictionary
literacy_data = {
    "Kerala": 93.9,
    "Delhi": 86.3,
    "Maharashtra": 82.9,...
    }

# Convert and display with one line!
quick_map(
    BharatViz.from_dict(literacy_data),
    title="Literacy rate by state",
    legend_title="Percentage (%)",
    color_scale="greens",
    api_url=API_URL,
)
```



https://github.com/saketlab/bharatviz/tree/main/server/examples

Use BharatViz maps in R

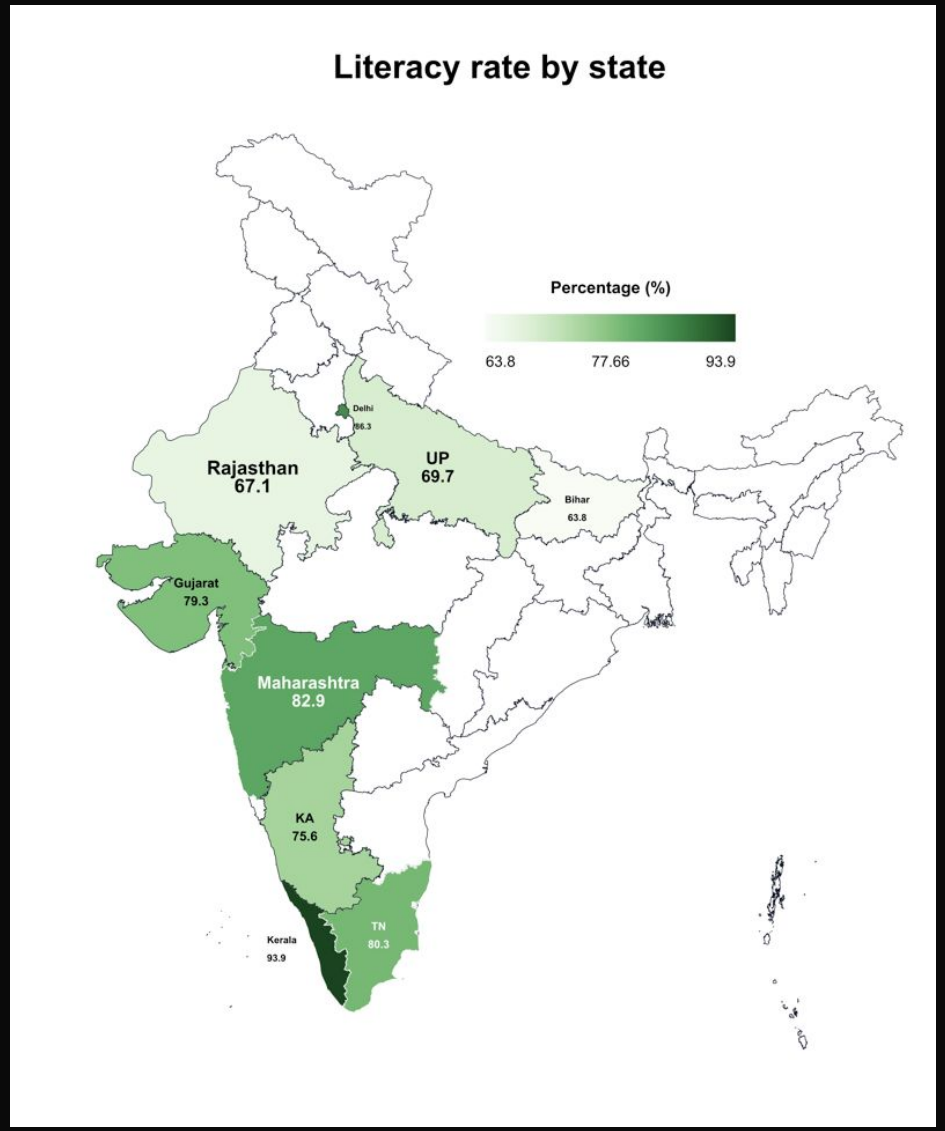
```
library(R6)
source("bharatviz.R")


# Create data from a simple dictionary
literacy_data <- list(
  "Kerala" = 93.9,
  "Delhi" = 86.3,
  "Maharashtra" = 82.9, …
  )

# Convert and display with one line!
quick_map(
  from_dict(literacy_data),
  title = "Literacy rate by state",
  legend_title = "Percentage (%)",
  color_scale = "greens"
)

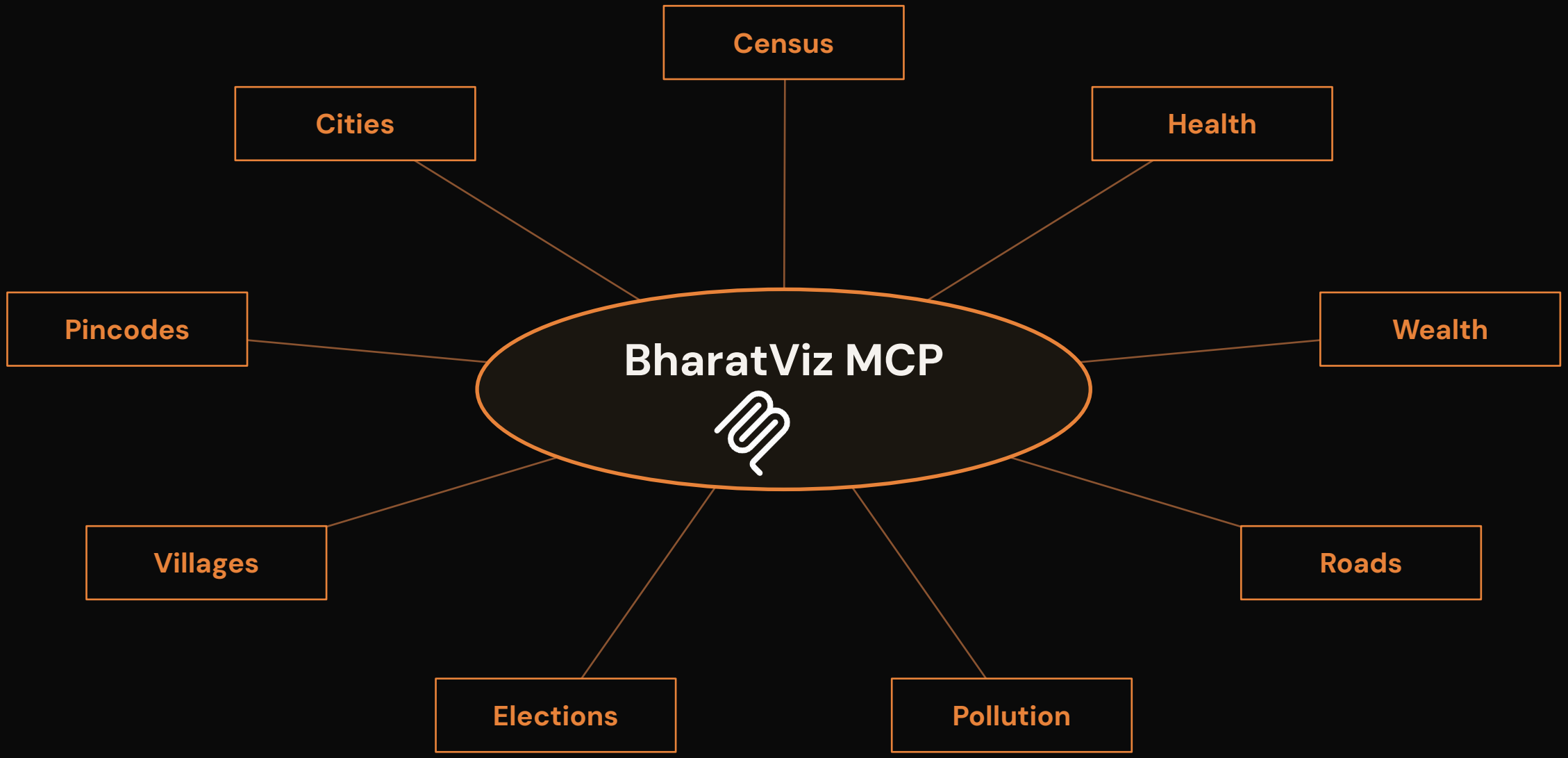
  color_scale = "greens"
)
```

https://rpubs.com/saketkc/bharatviz



But maps are for humans.

What about agents?

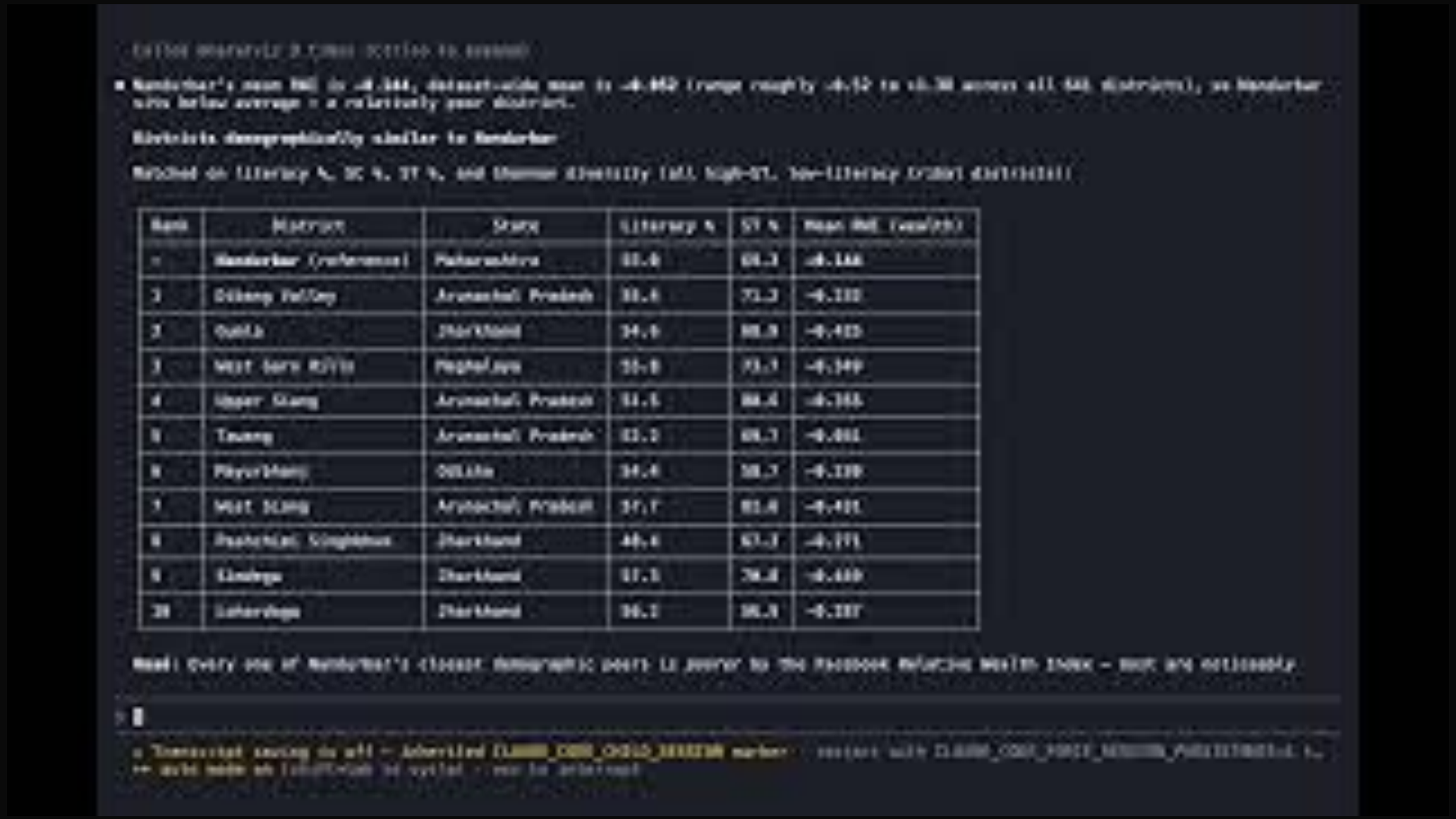

Census
Cities
Health
Pincodes
BharatViz MCP
Wealth
Villages
Roads
Elections
Pollution

Ask it in plain English.

“Which districts are demographically similar to Nandurbar, and how wealthy are they?”

“Which health facilities are close to my pincode 400071?

“How have hazaribagh boundaries changed over the years?



Nandurbar's mean BMI is -0.344, dataset-wide mean is -0.002 (range roughly -0.52 to +0.38 across all 640 districts), so Nandurbar sits below average — a relatively poor district.

Districts demographically similar to Nandurbar

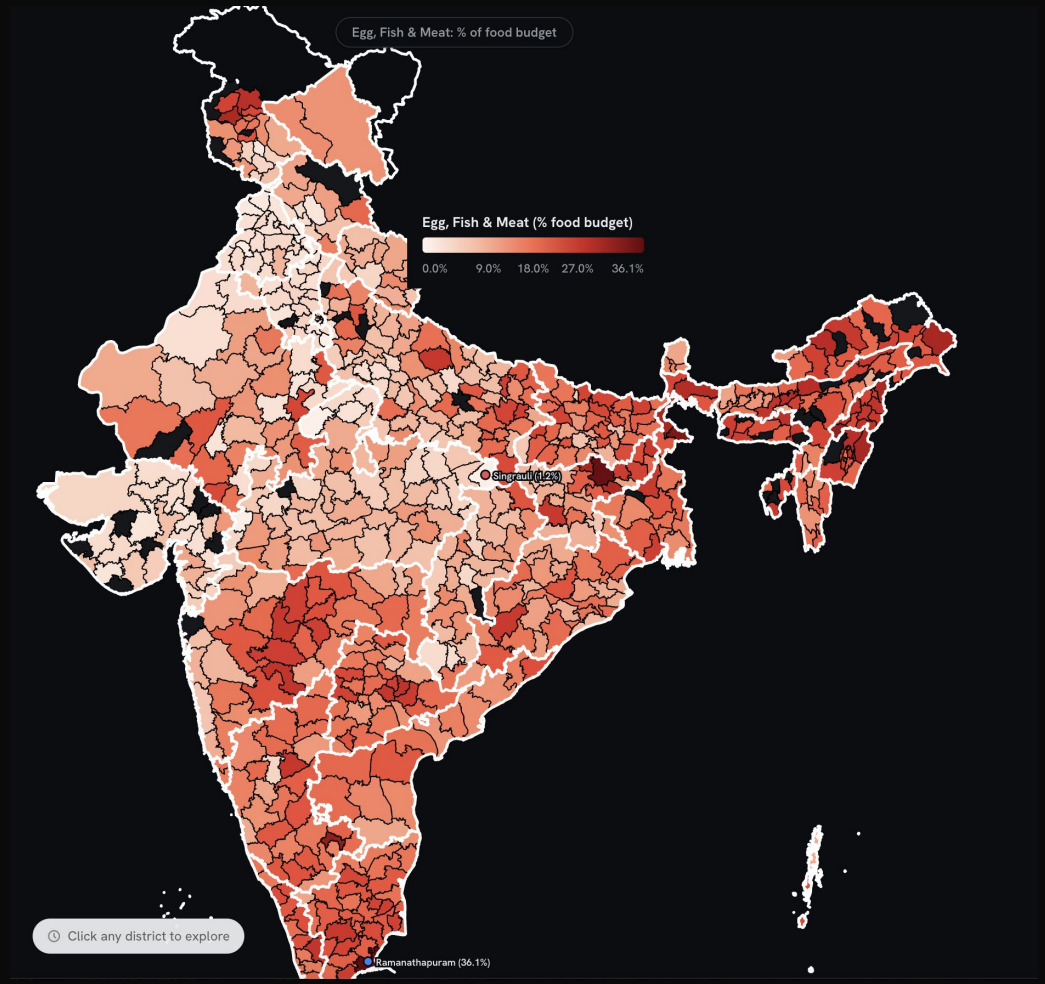
Matched on literacy %, SC %, ST %, and Shannon diversity (all high-ST, low-literacy tribal districts):

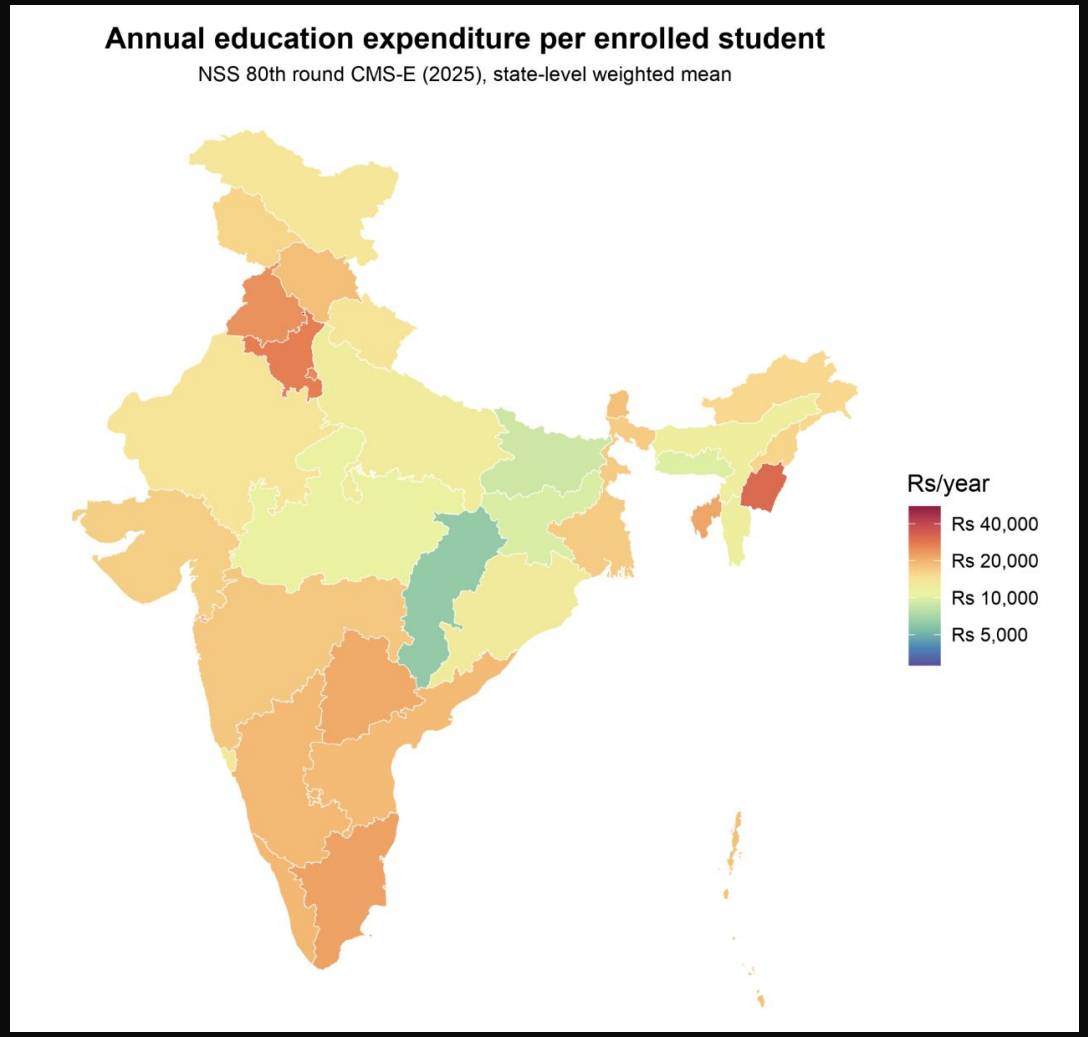
Rank	District	State	Literacy %	ST %	Mean BMI (sex/z)
—	**Nandurbar** (reference)	Maharashtra	55.6	69.3	-0.344
1	Dibang Valley	Arunachal Pradesh	68.4	71.2	-0.318
2	Kokrajhar	Jharkhand	54.9	88.8	-0.415
3	West Garo Hills	Meghalaya	55.8	73.1	-0.349
4	Upper Siang	Arunachal Pradesh	61.5	84.4	-0.365
5	Tawang	Arunachal Pradesh	63.2	68.7	-0.401
6	Pakyong	Sikkim	54.4	58.7	-0.339
7	West Siang	Arunachal Pradesh	57.7	81.6	-0.421
8	Jhalariya Singhbhum	Jharkhand	48.4	67.3	-0.371
9	Simdega	Jharkhand	57.3	78.8	-0.449
10	Lohardaga	Jharkhand	56.7	66.9	-0.387

Read: Every one of Nandurbar's closest demographic peers is poorer by the Poshan Rafaichi Wealth Index — most are noticeably

https://bharatviz.org/mcp

What have I learned about India with BharatViz ?

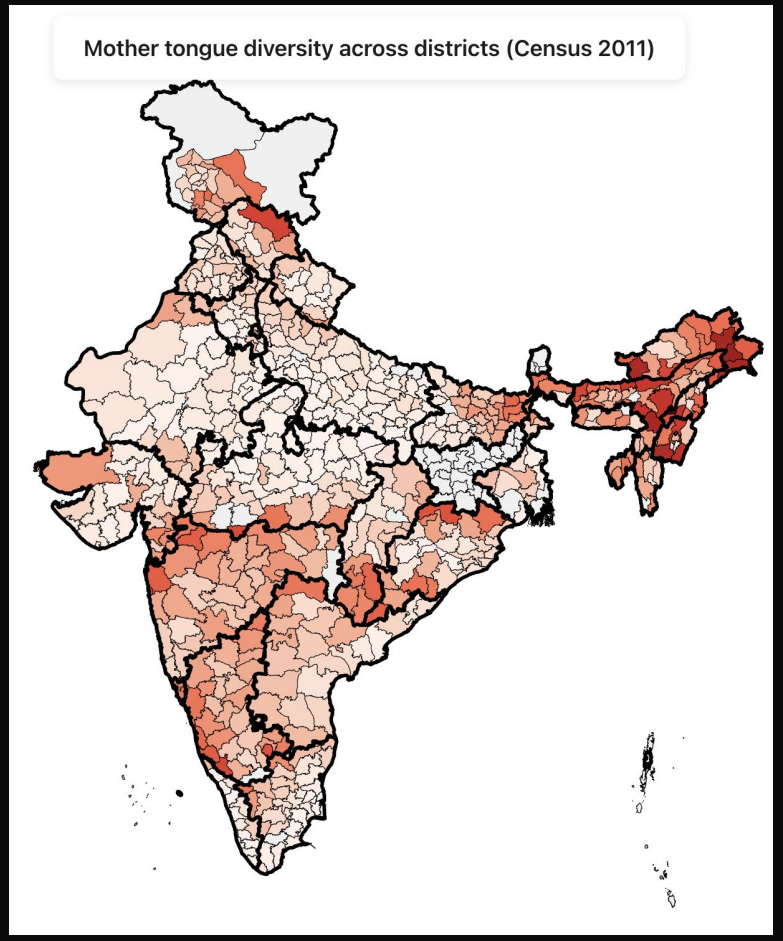




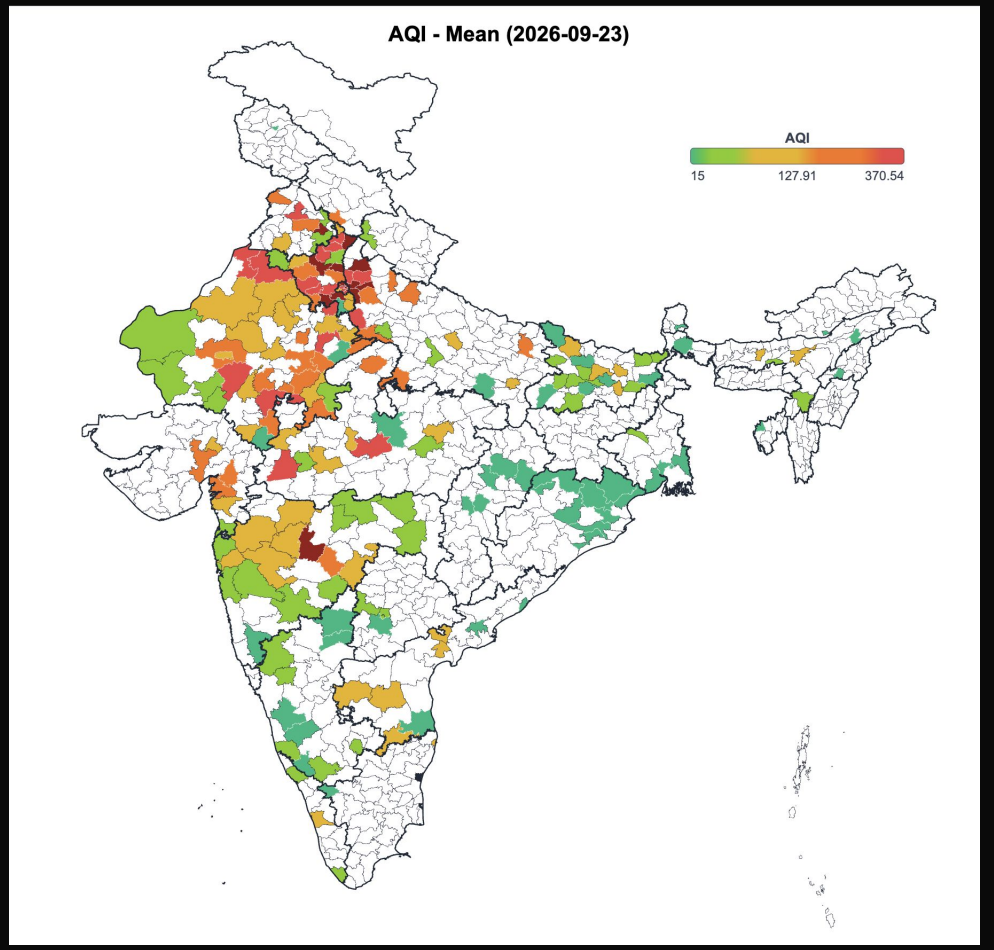
https://howindiaeats.saketlab.org/

https://www.cse.iitb.ac.in/~sohoni/NTAsuggestions.pdf

What have I learned about India with BharatViz ?



https://samudaya.saketlab.org/



https://vayuayan-archive.saketlab.org

BharatViz is made possible by a strong FOSS stack







hyperquet

GeoPandas

MapLibre

VITE

TS

express

BharatViz is made possible by the wonderful FOSS community

Boundaries

- Census of India (1872–2011)
- Local Government Directory (LGD)
- Survey of India / ISRO Bhuvan (NRSC)
- DHS Program / NFHS-4, NFHS-5

Demographics & Wealth

- SHRUG 2.1
- Meta / Facebook Data for Good (Wealth Index)

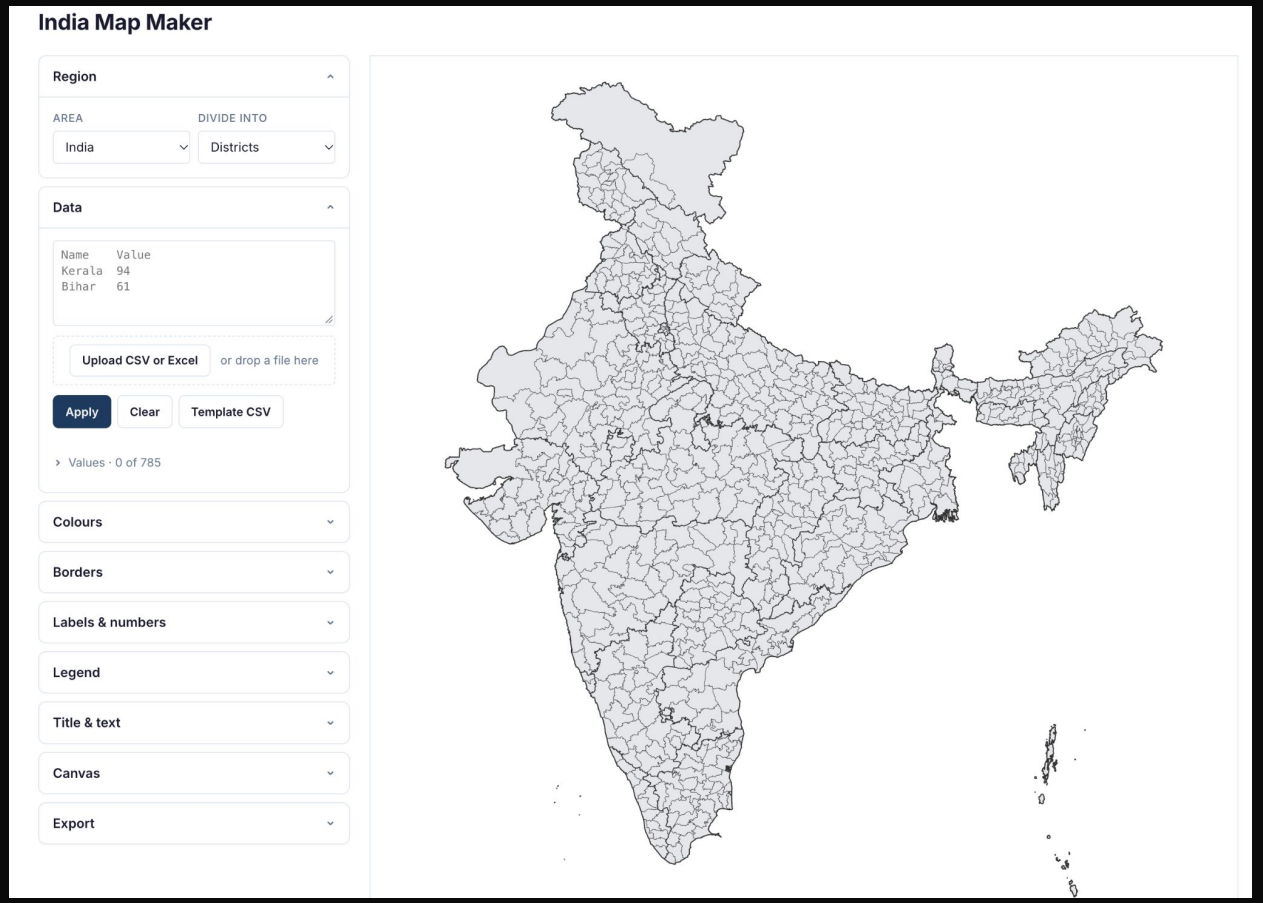
Health & Environment

- National Health Portal (data.gov.in, GODL)
- ICDS / Ministry of Women & Child Dev. (GatiShakti)
- PM2.5 & nightlights (satellite remote sensing)
- PMGSY rural roads (Ministry of Rural Dev.)

Thanks to DataMeet and OpenCity communities, Sreeram Kandimalla (@ramSeraph) and Shivakumar Jolad (*@shivakjolad*, FLAME university) for generously sharing their data!

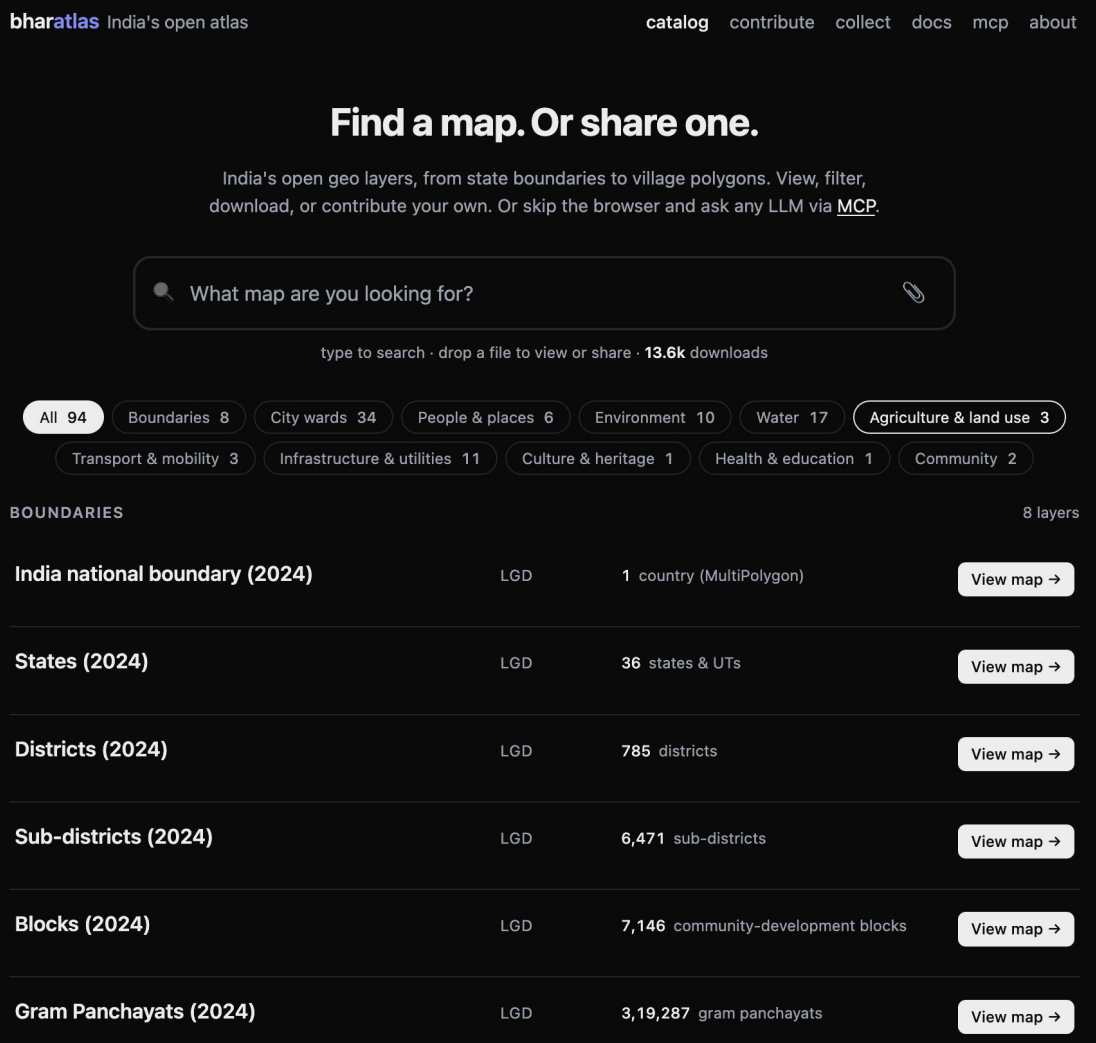
https://opencity.in
https://datameet.org

We are not alone



https://yashveeeeeeer.github.io/india-geodata/maps

by Yashveer Singh



https://bharatlas.com/

by Sathya Sankaran

Fork it.
Self-host it.
Add missing shapefiles.
All contributions welcome!

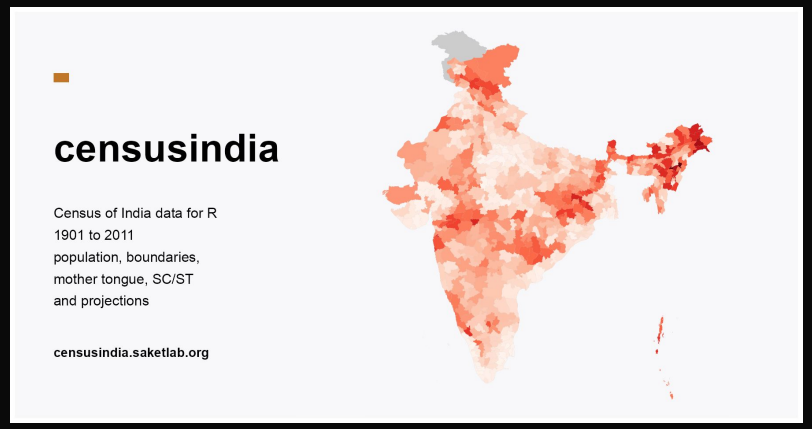
It's yours.

github.com/saketlab/bharatviz

Go map something that matters or something you always wanted.

bharatviz.org

Interested in contributing to Tech/Digital Health?



varunayan

vayuayan

seqout

FAST SEQUENCING METADATA SEARCH

alethia

github.com/saketlab

saketc@iitb.ac.in