

SPATIOTEMPORAL ANALYSIS OF NDVI CHANGES WITH RAINFALL

EARTH OBSERVATIONS (EO) SYSTEMS

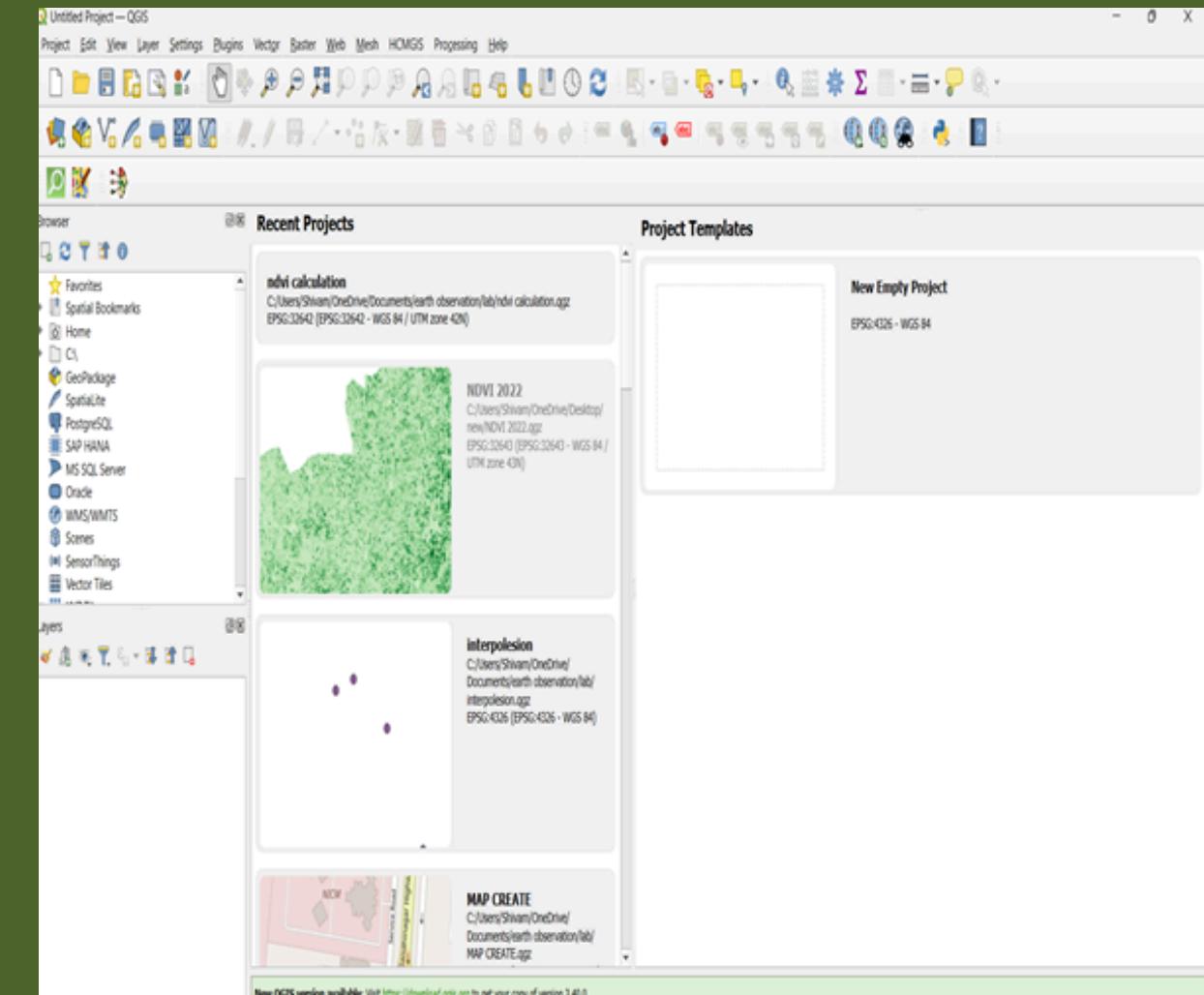
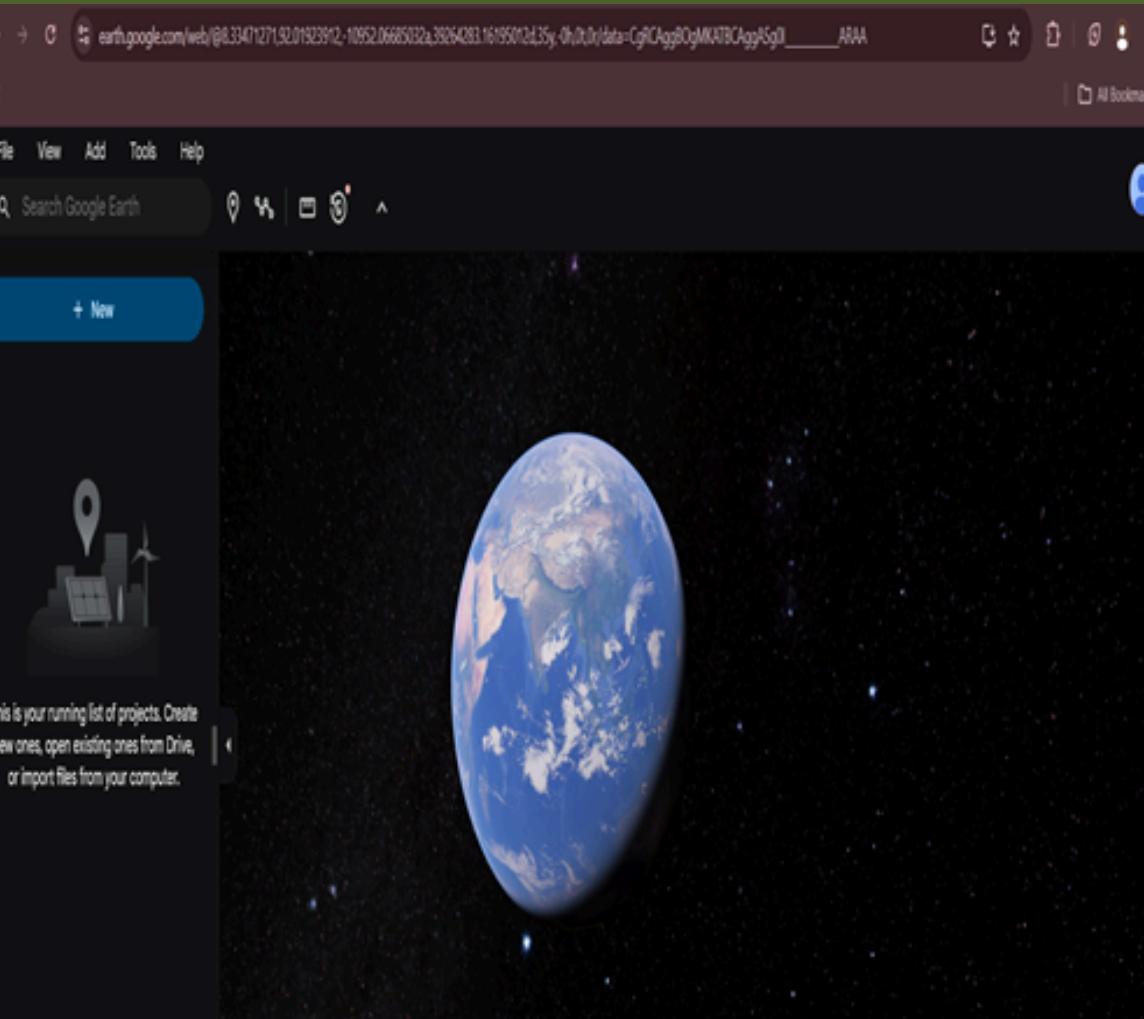
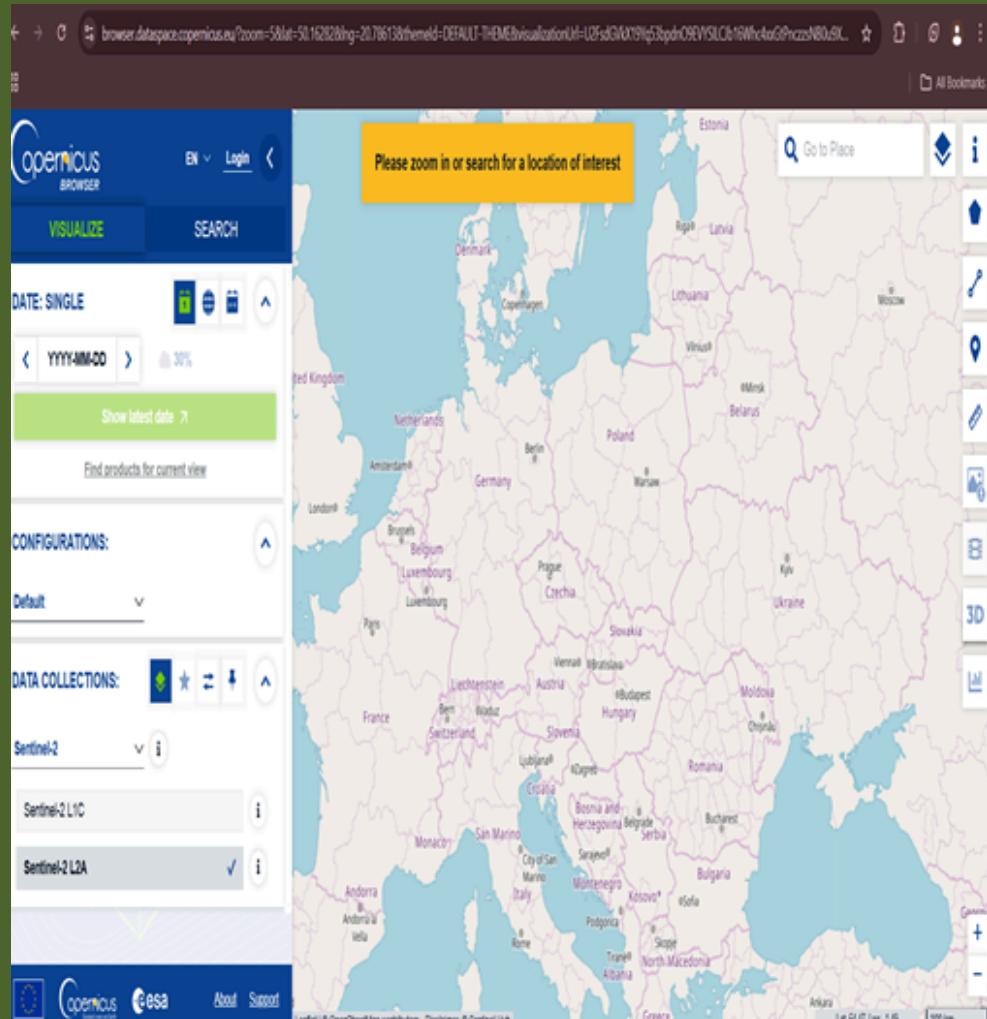
M.Sc. AGRICULTURAL ANALYTICS
PROJECT REPORT 2024

NIDHI CHAUDHARY
(ID :-202419004)

REPORT PRESENTATION

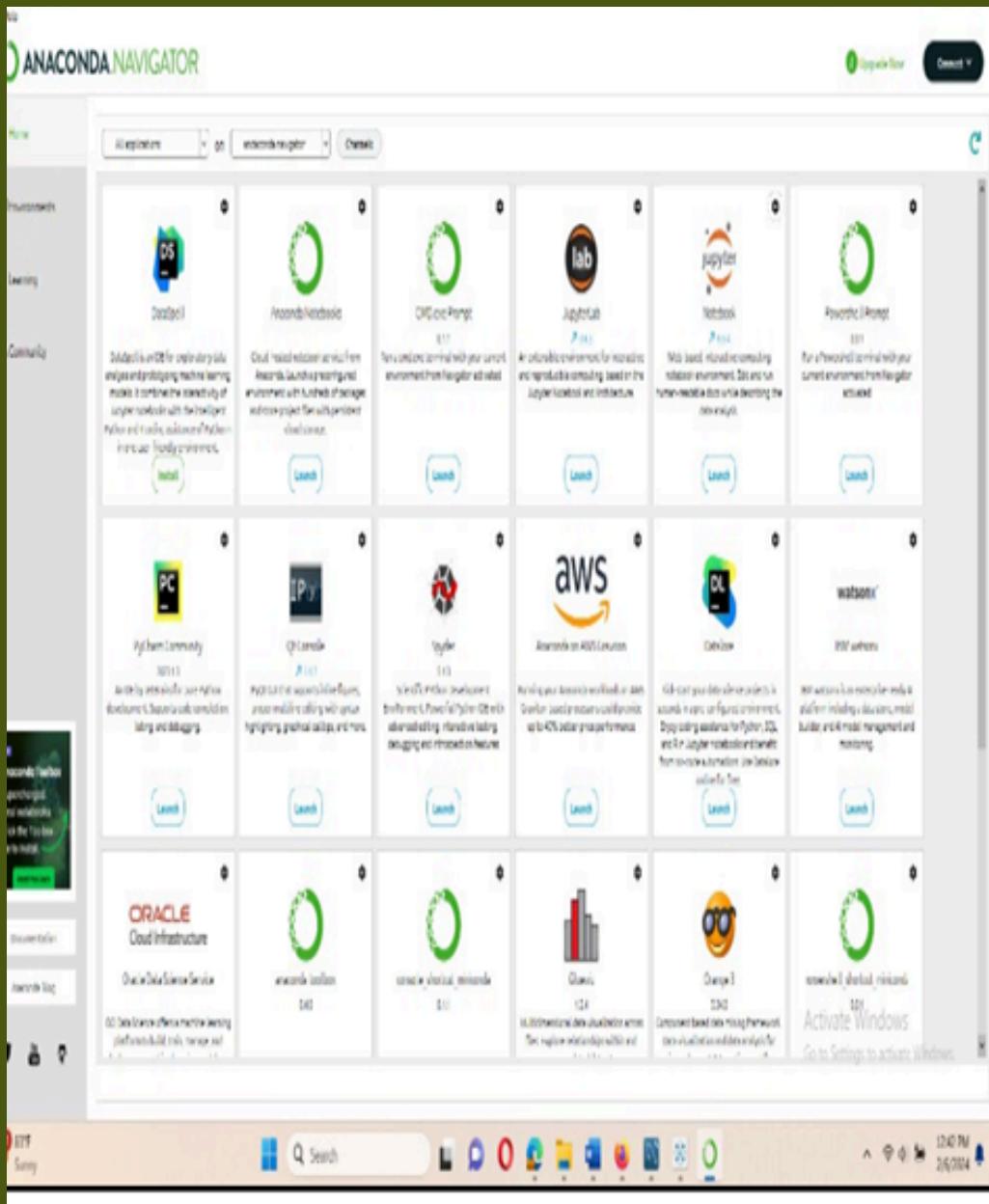


Software Used



COPERNICUS BROWSER IMDLIB- A PYTHON LIBRARY

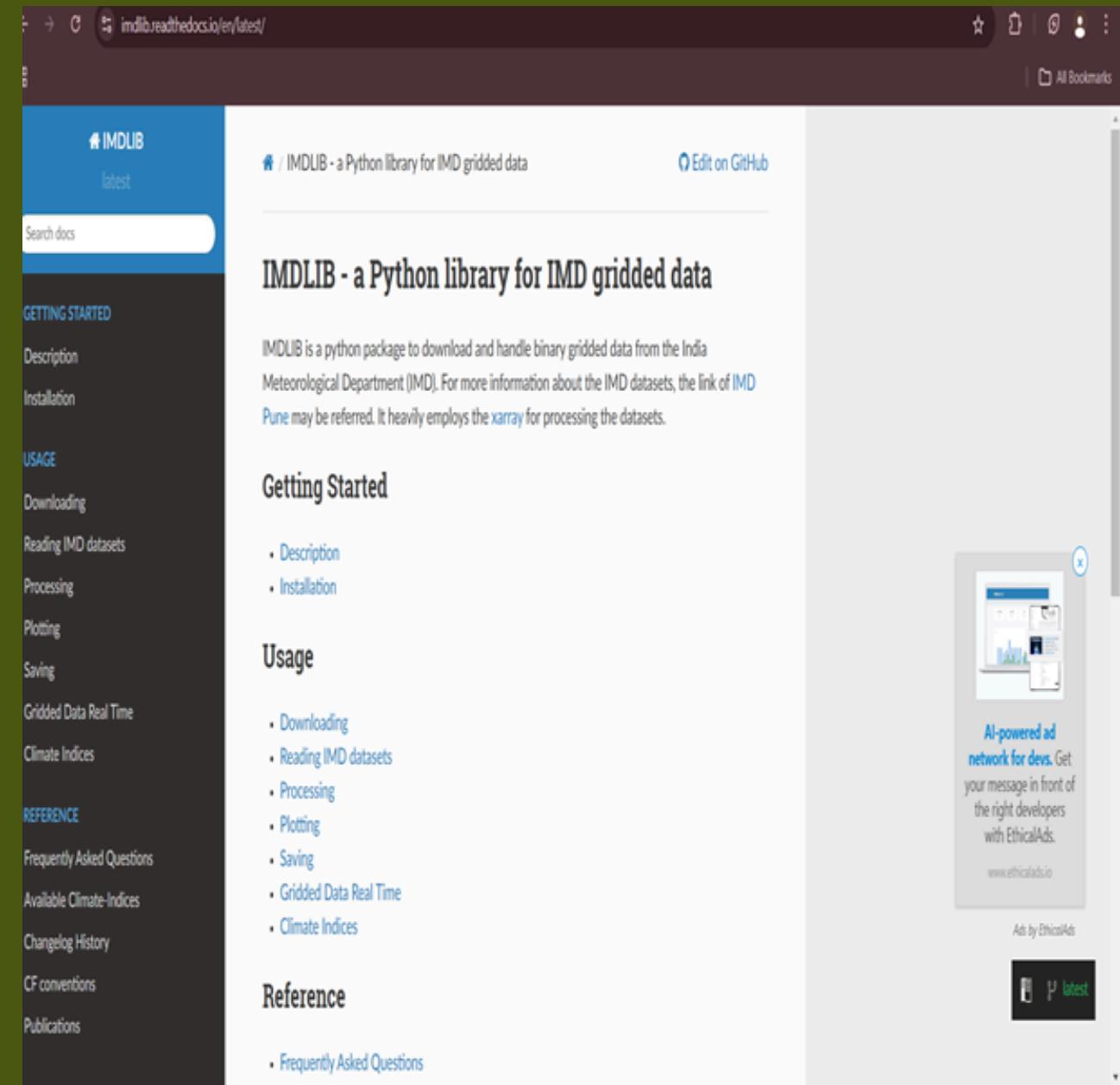
COPERNICUS BROWSER



Anaconda navigator



python



IMDLIB- A PYTHON LIBRARY



STUDY AREA

- **Study Area:** Vadgam, Banaskantha, Gujarat

- **Why Vadgam?**

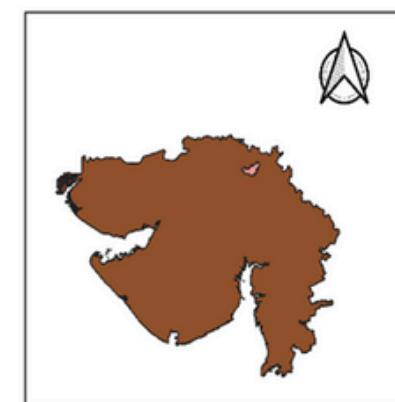
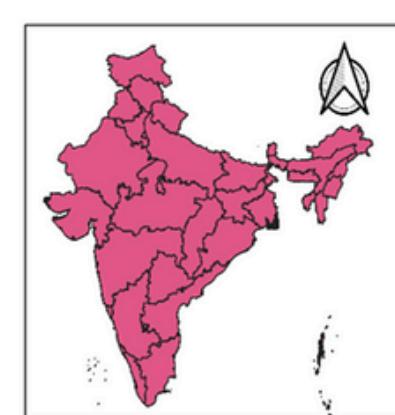
- Native familiarity with the region's climate and agriculture.

- **Significance:** Semi-arid conditions and variable rainfall make it an ideal case study for vegetation response.

Overview of NDVI

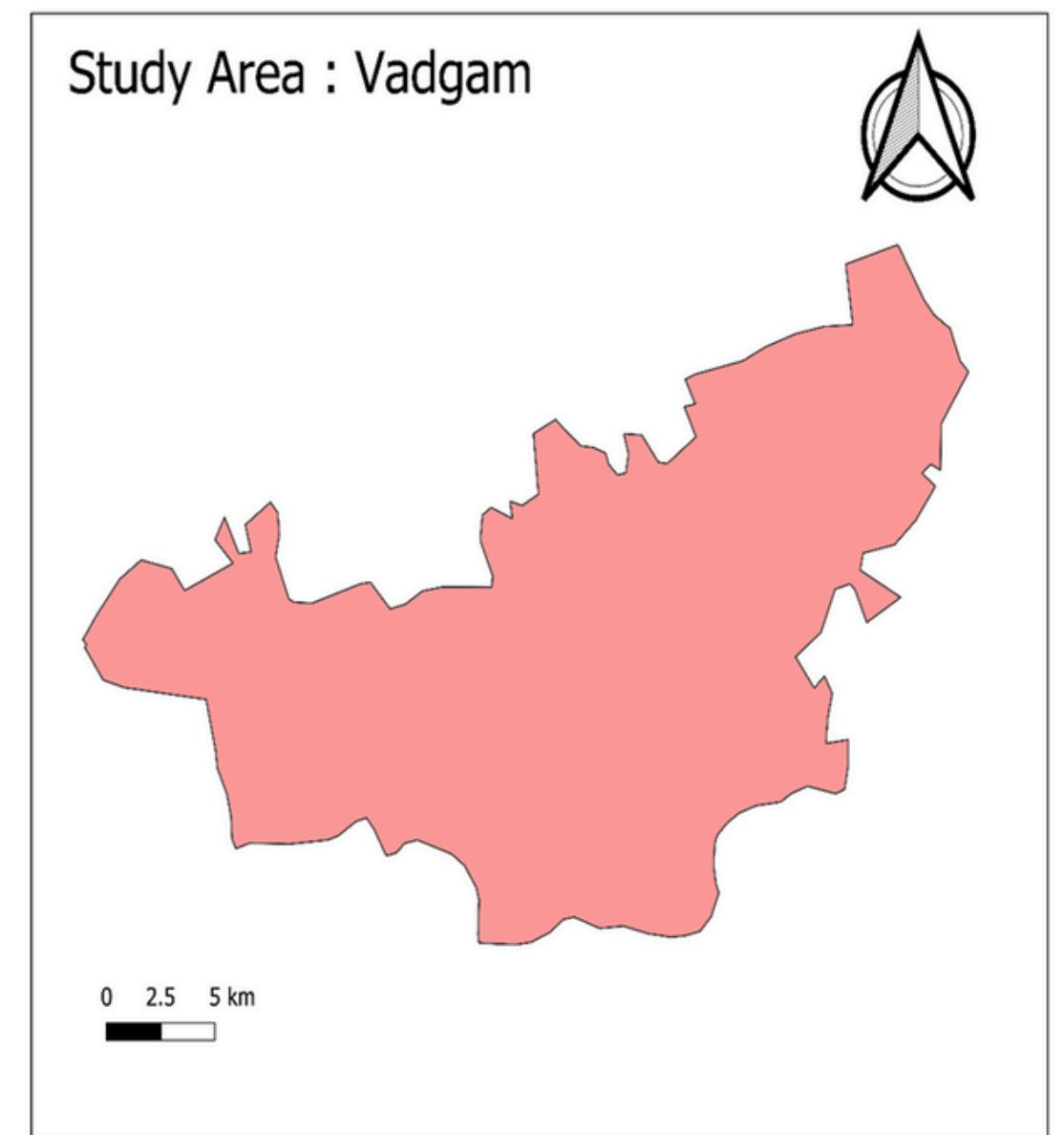
- **Definition:** NDVI measures vegetation greenness and health by analyzing satellite reflectance data.

- **Importance:** Widely used for ecological assessment, drought detection, and agriculture management.

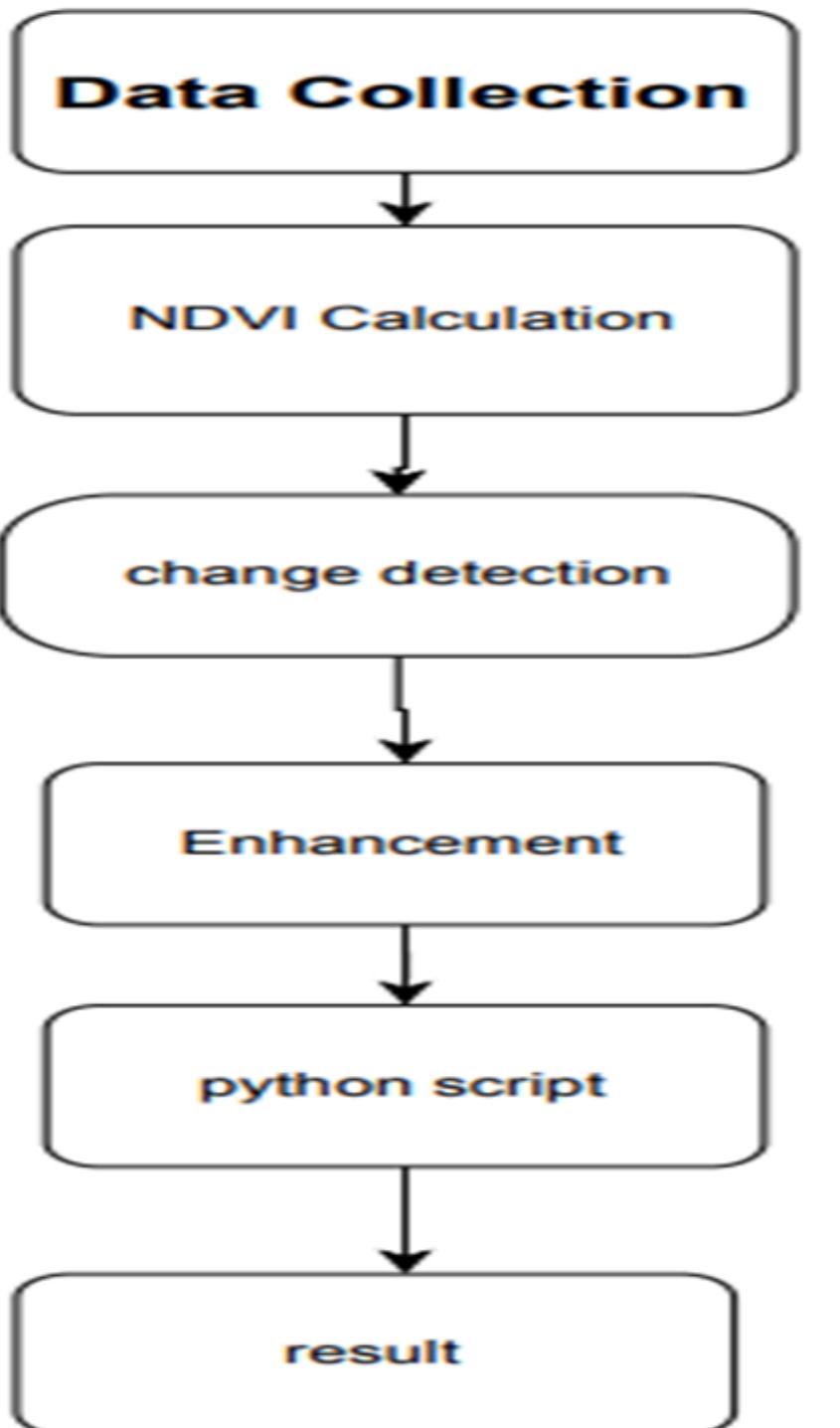


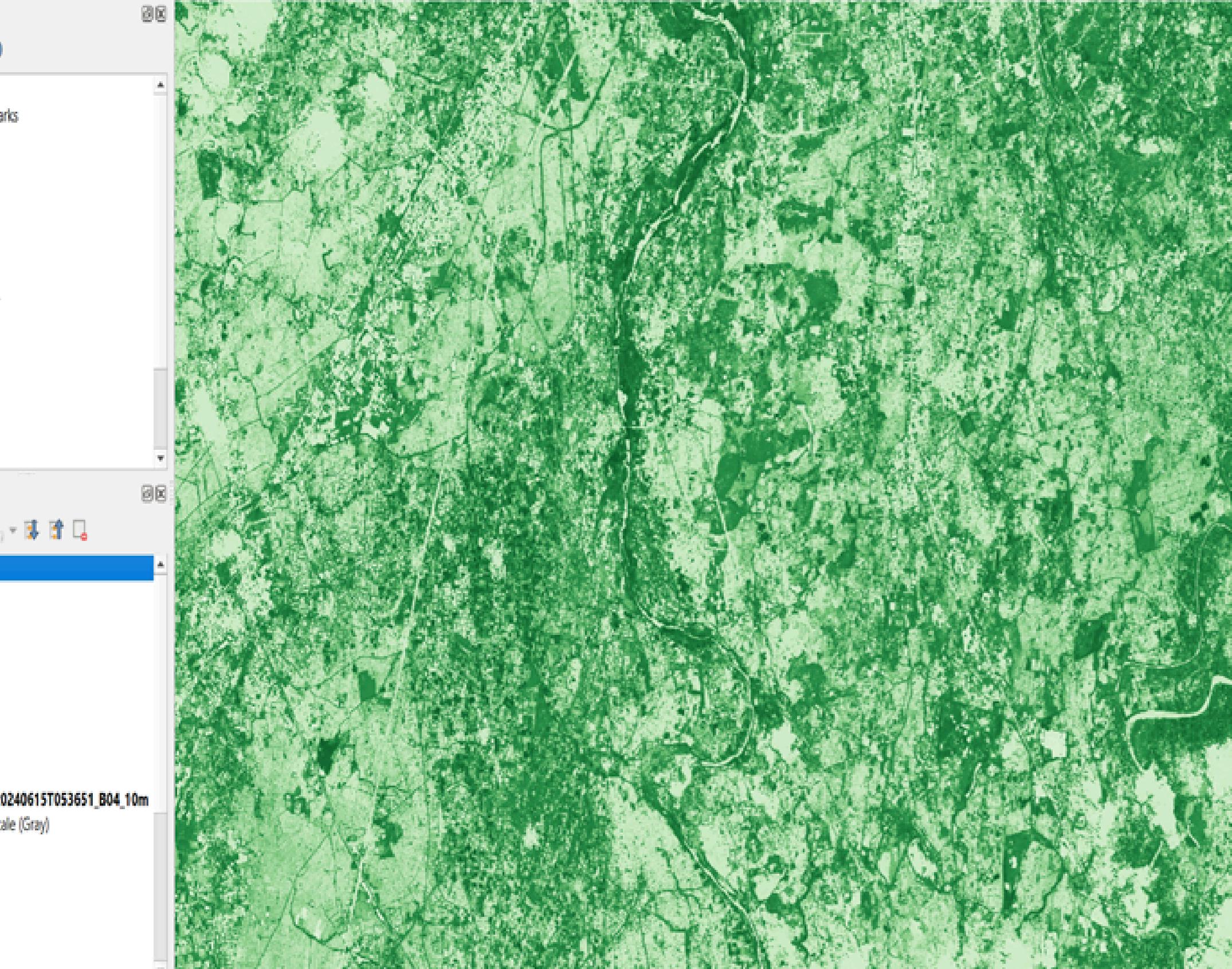
LEGENDS		
INDIA BOUNDARY		
GUJARAT		
VADGAM		

0 2.5 5 km



METHODOLOGY





0240615T053651_B04_10m
ale (Gray)

Coordinate 849763, 2539994 Scale 1:126967 Magnifier 100% Rotation 0.0° Render



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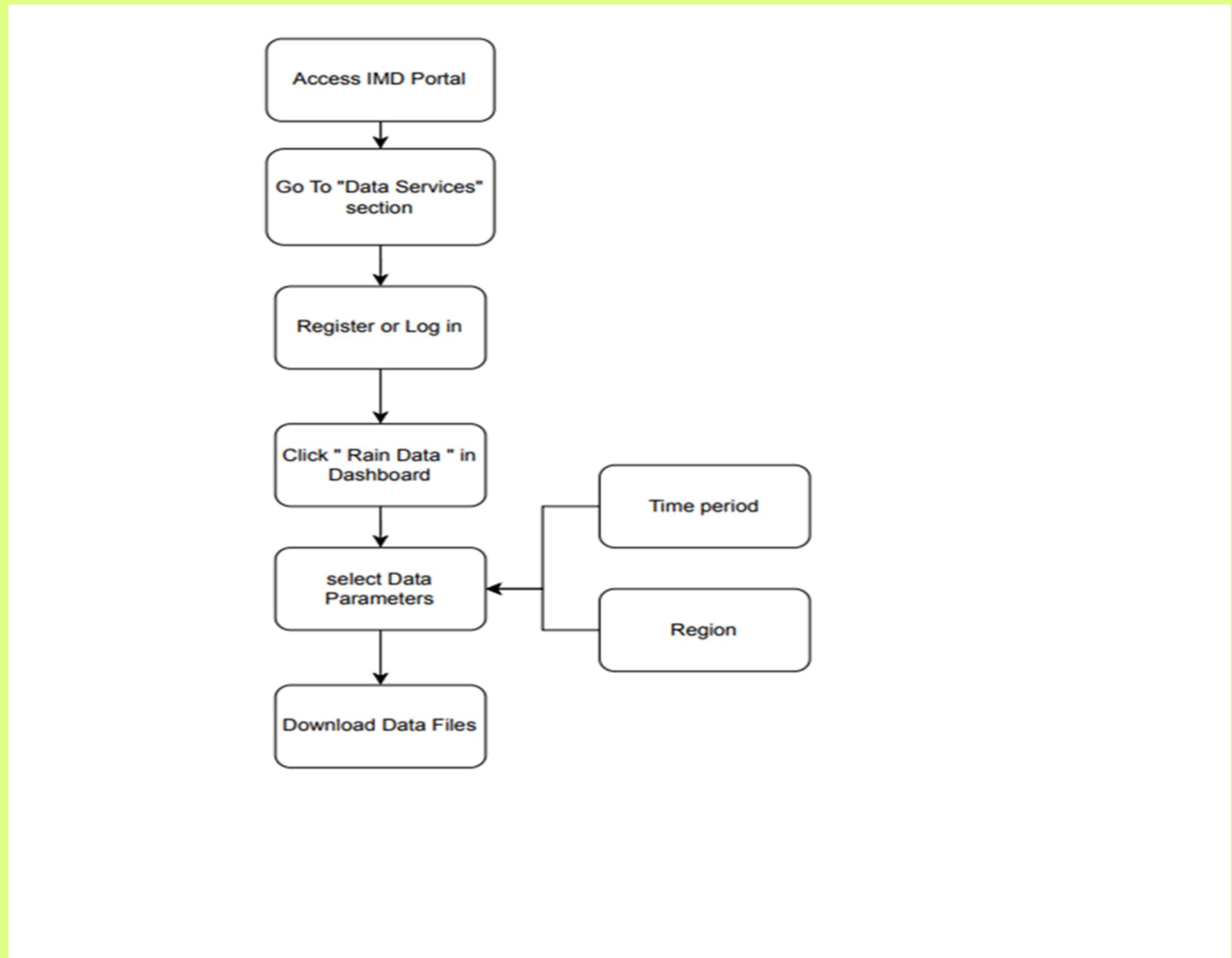
Data Collection

1) BAND :- (RED/NIR)

- Accessing Copernicus Data
- Copernicus Open Access Hub
- Registration/Login:
- Defining Search Parameters
- Searching and Previewing
- Downloading Data:
- Selecting Date and Sentinel Mission

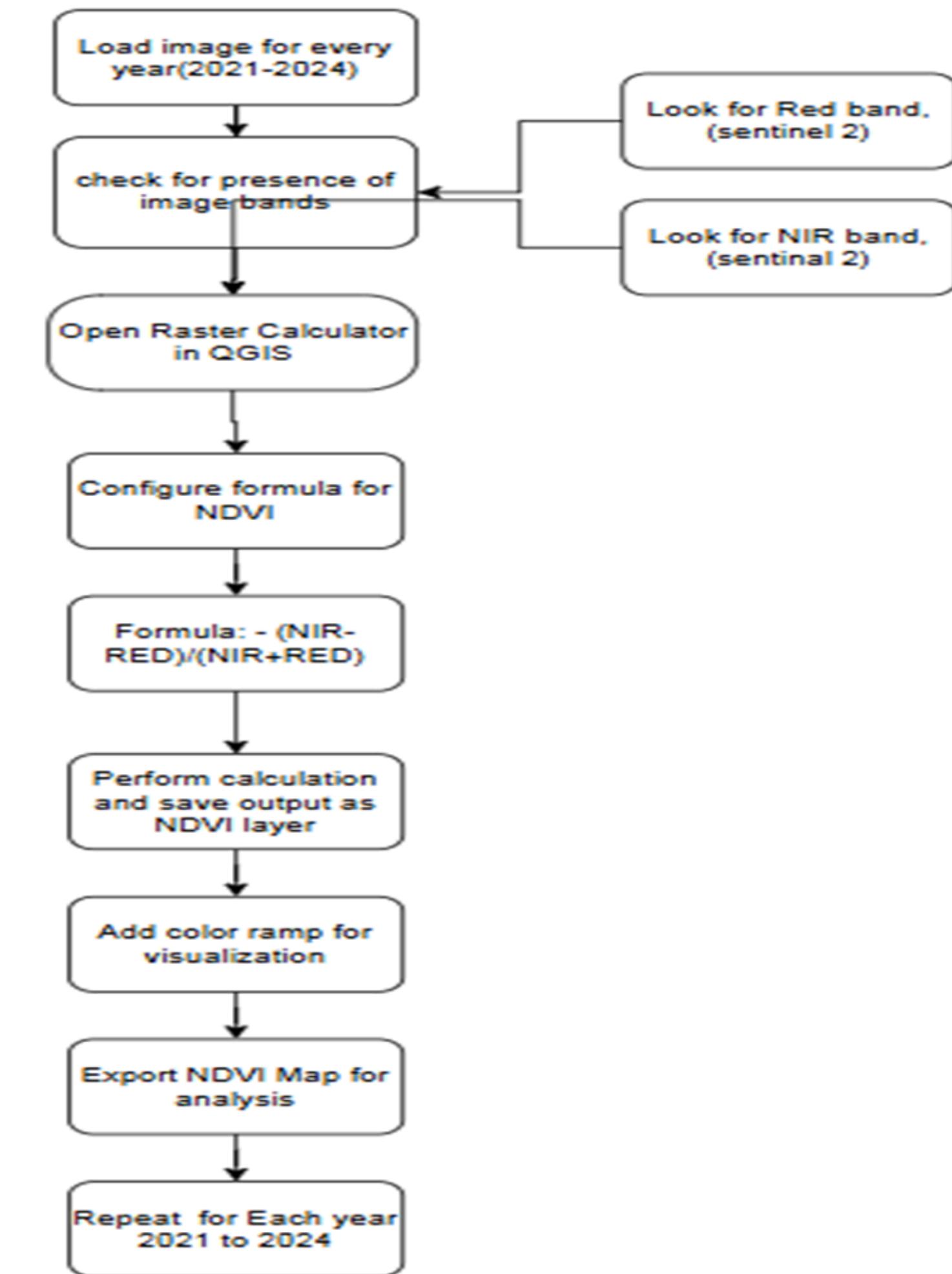


2) IMD(Indian Meteorological Department):LIB



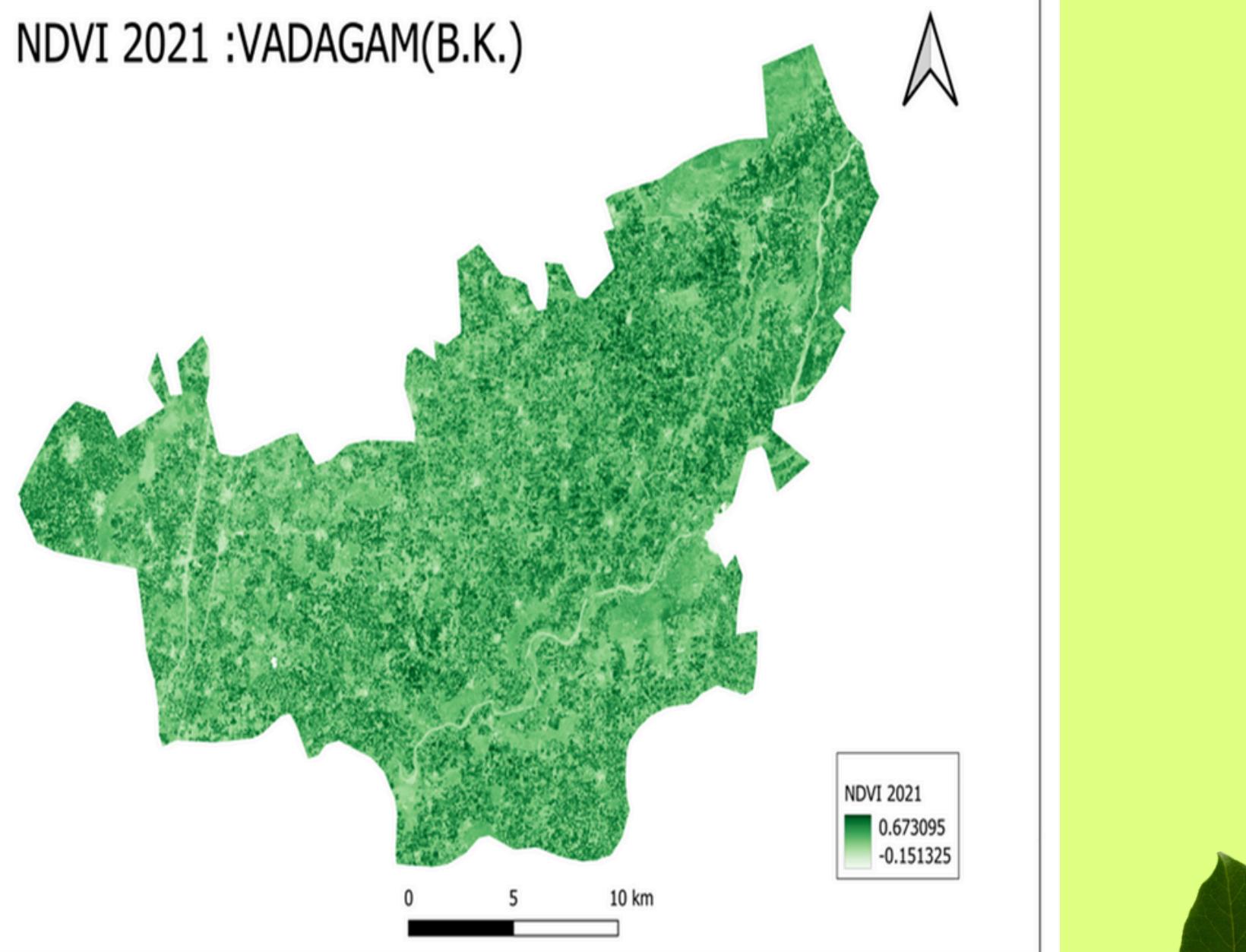


NDVI CALCULATION

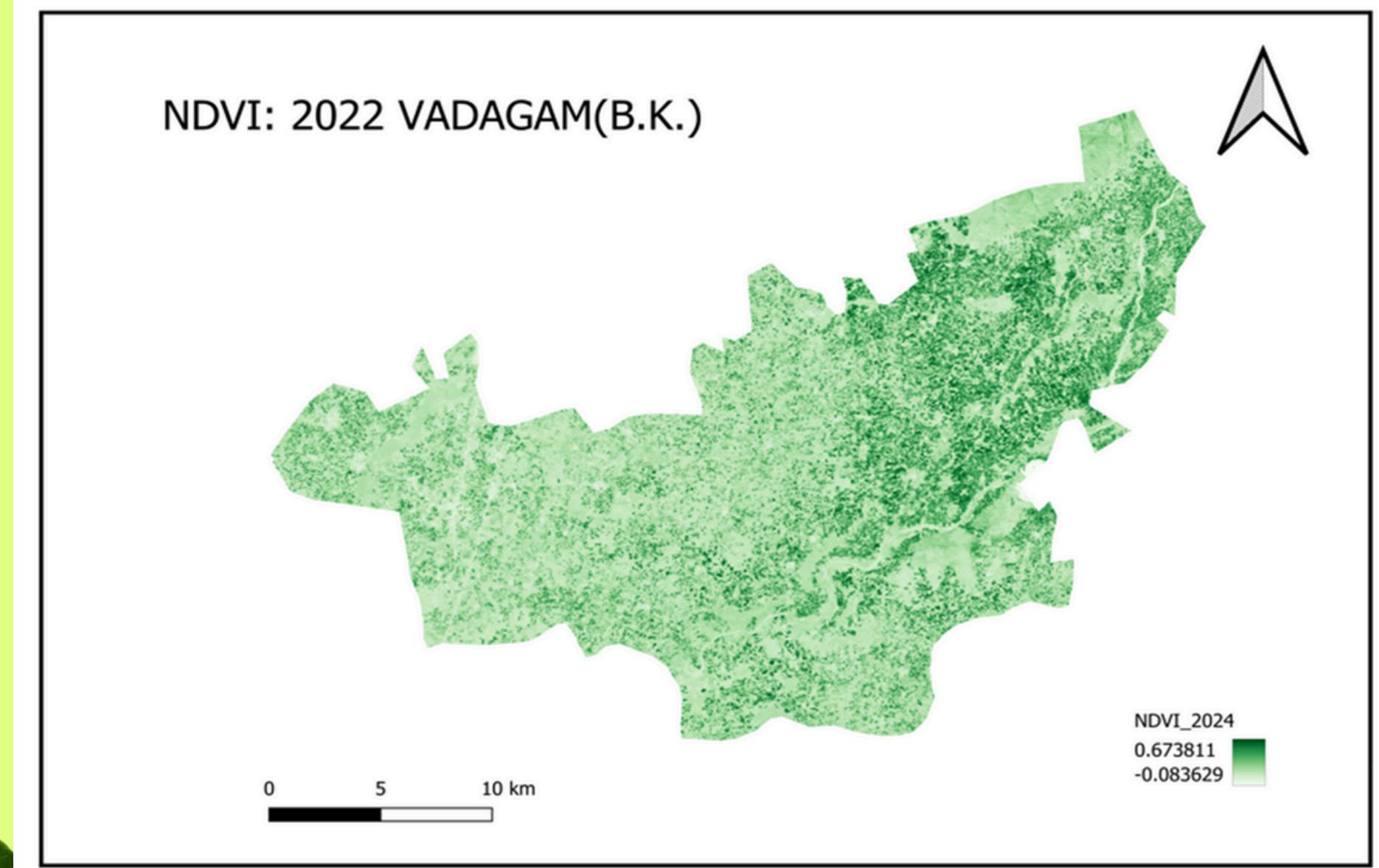




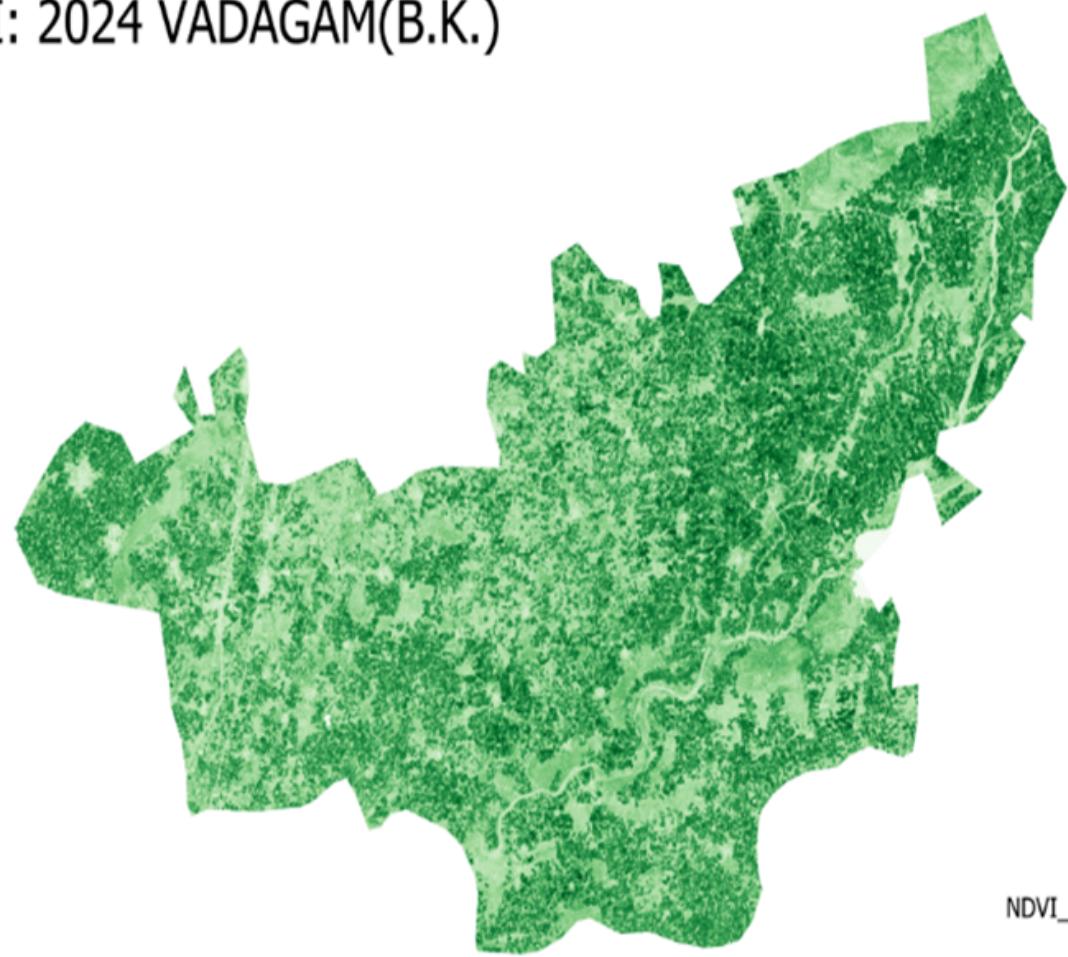
NDVI 2021 :VADAGAM(B.K.)



NDVI: 2022 VADAGAM(B.K.)



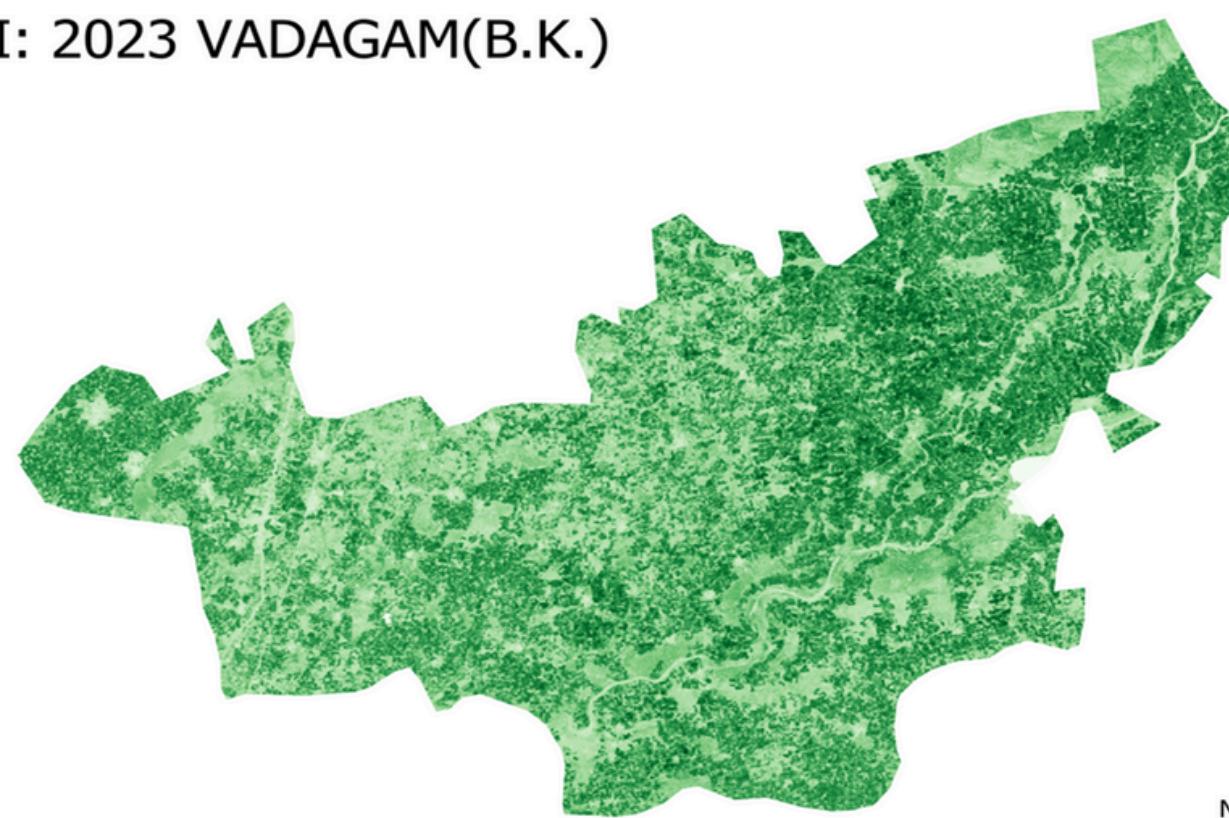
NDVI: 2024 VADAGAM(B.K.)



0 5 10 km

NDVI_2024

NDVI: 2023 VADAGAM(B.K.)



0 5 10 km

NDVI 2023



CHANGE DETECTION AND IMAGE ENHANCEMENT



Reclassify steps

- Step 1: Import the Raster File
- Step 2: Open the Reclassification Tool
- Step 3: Setting up the Reclassification Tool(Recalssification Table)
- Step 4: Run the Reclassification
- Step 5: Check the Reclassified Layer
- Step 6: Save the Reclassified Raster (Optional)
- Step 7: Validation





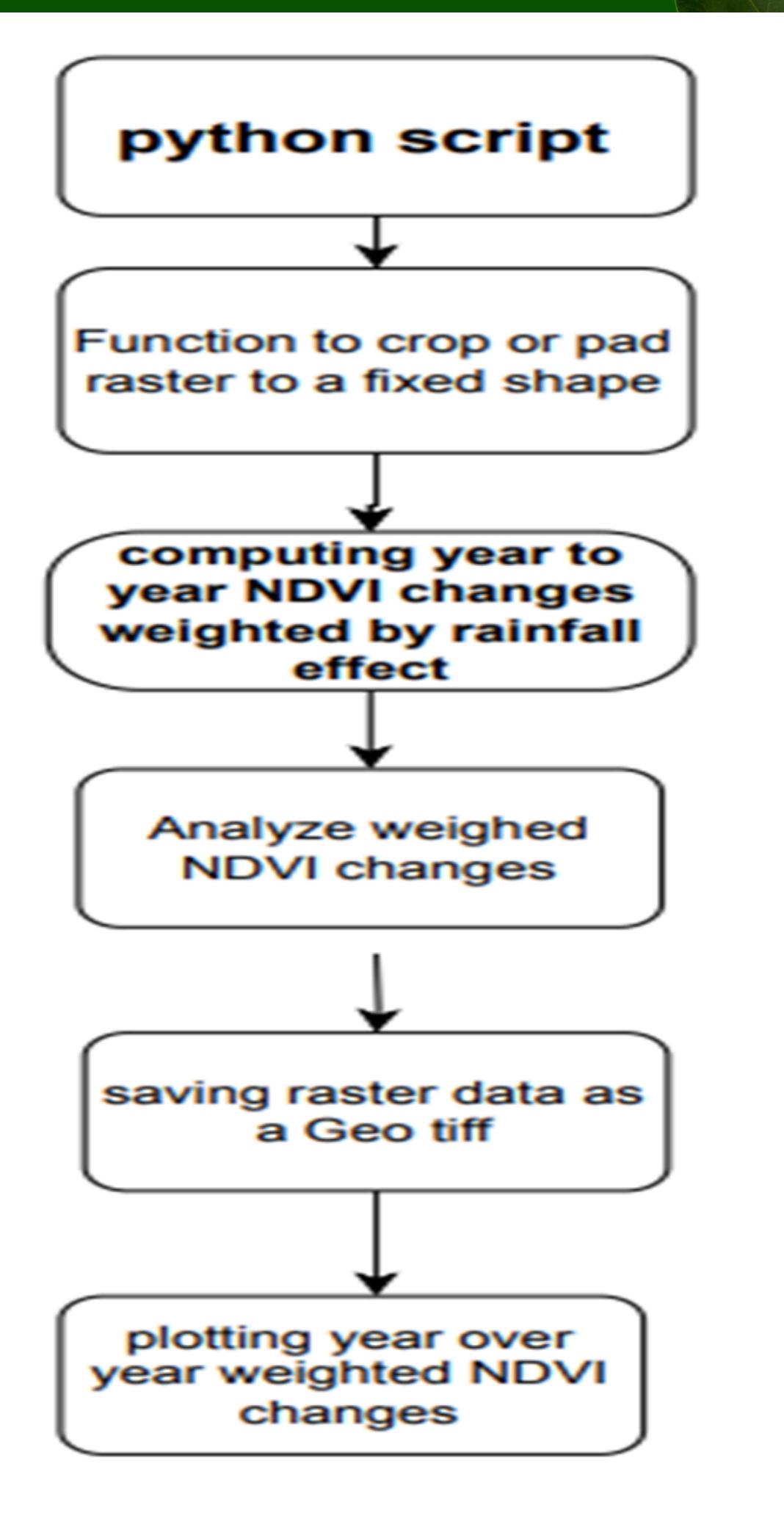
PYTHON SCRIPT

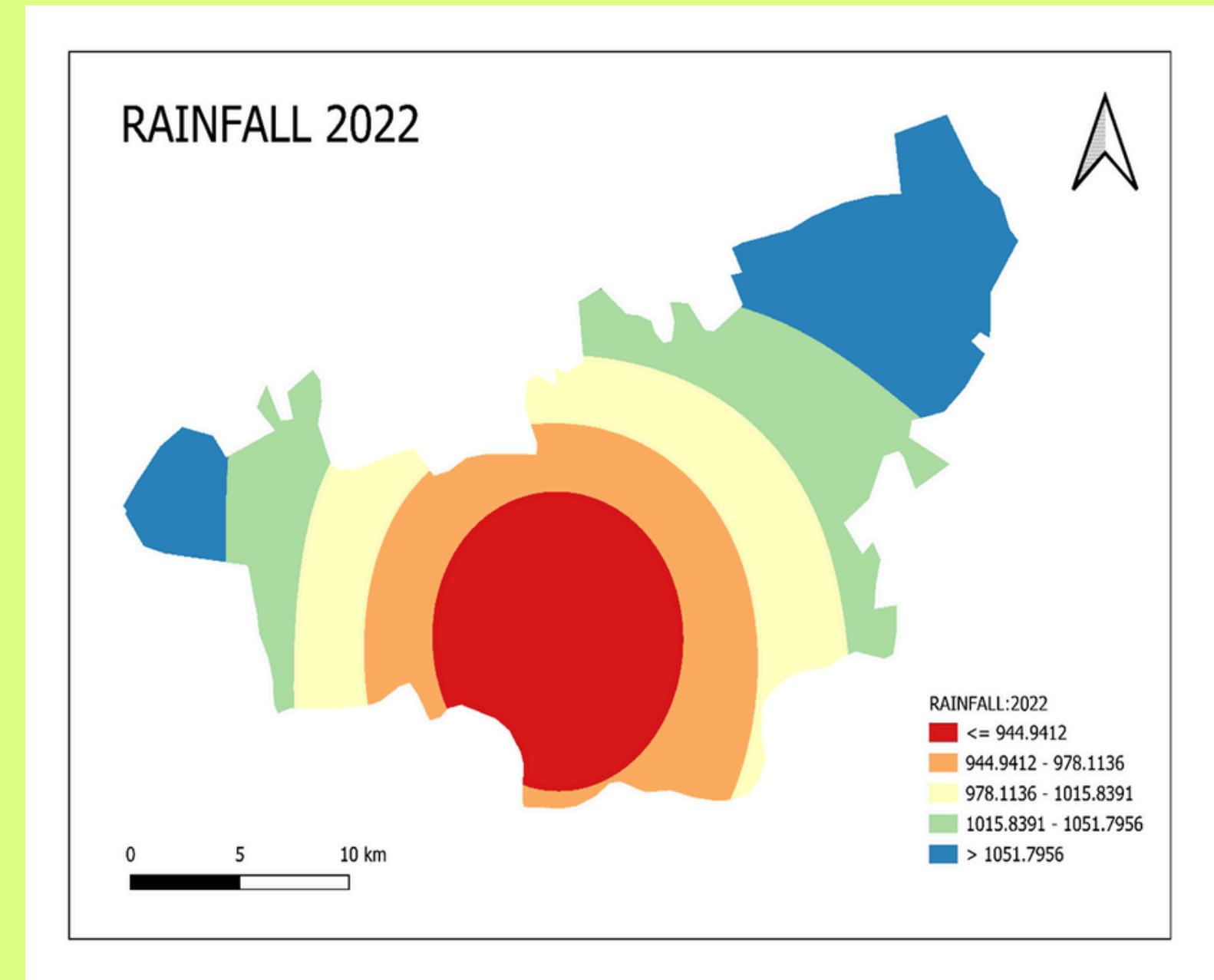
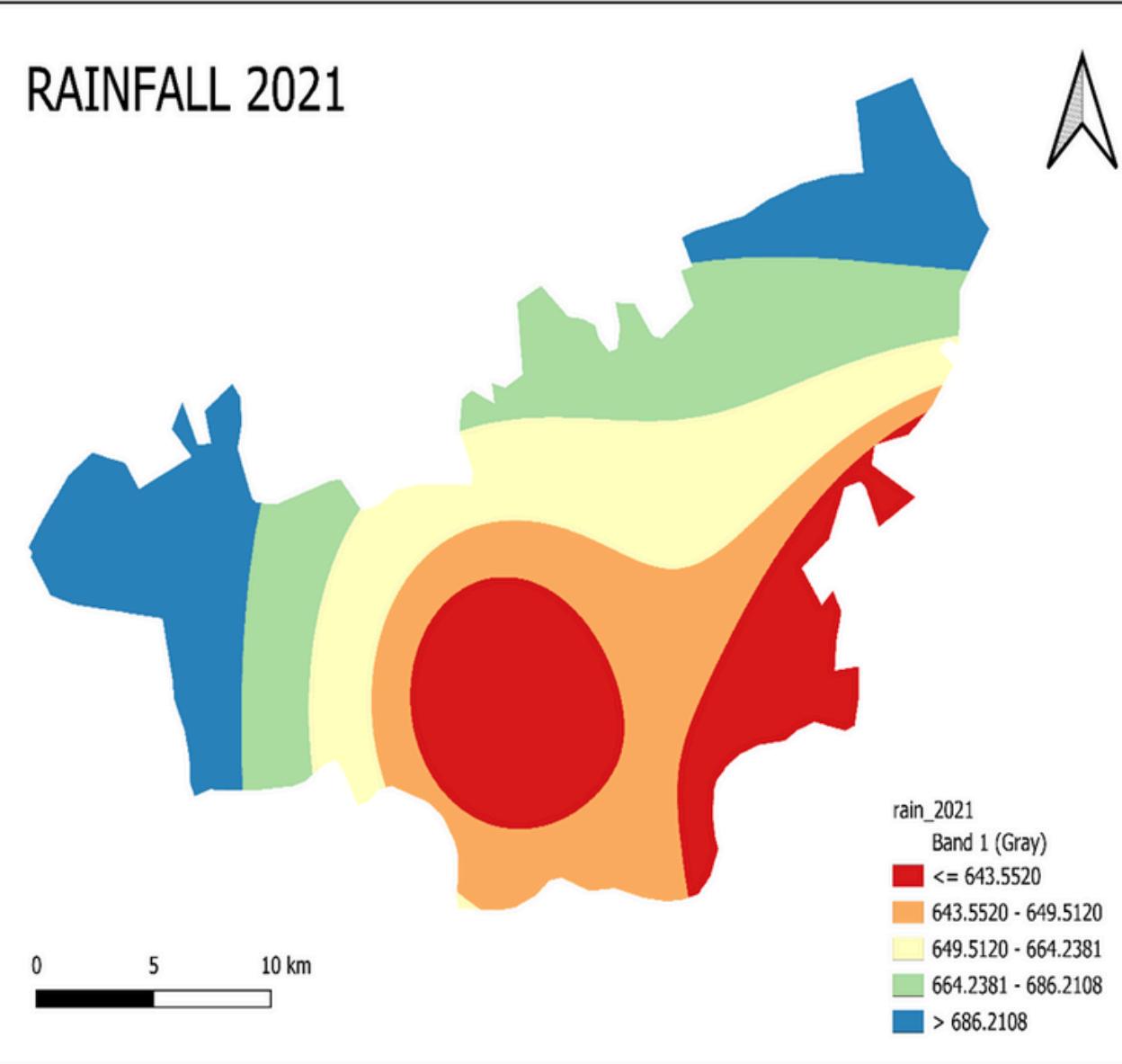
NDVI AND RAINFALL FILE PATHS: PROVIDE PATHS FOR NDVI AND RAINFALL RASTERS FOR ALL YEARS.

Crop Rasters Crop or pad NDVI and rainfall rasters to a fixed shape.

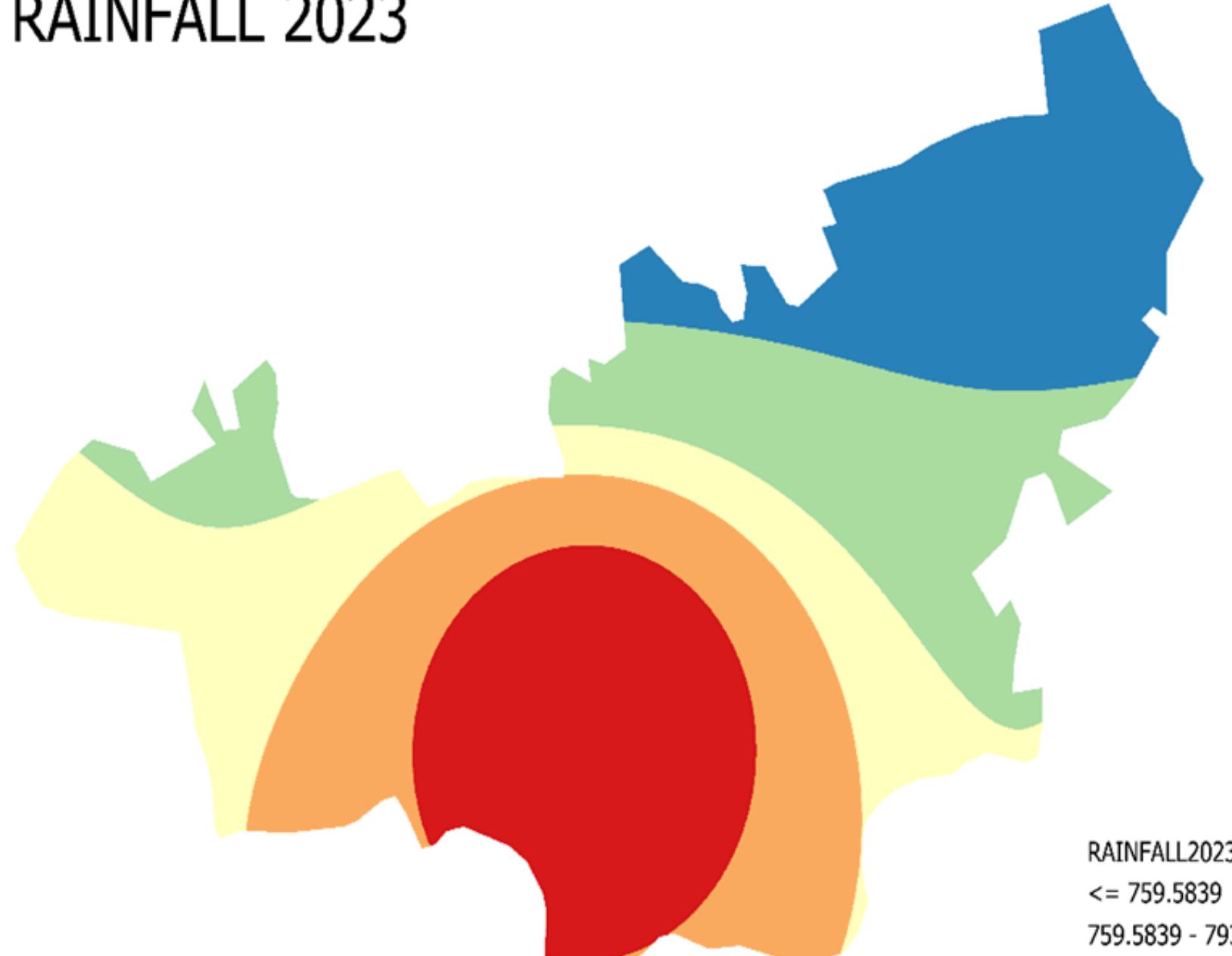
CALCULATE WEIGHTED CHANGES: CALCULATE WEIGHTED NDVI CHANGES WITH RAIN.

ANALYZE AND SAVE RESULTS: PRINT MEAN CHANGES, SAVE AVERAGE CHANGE AS GEOTIFF, AND PLOT YEAR-TO-YEAR CHANGES.





RAINFALL 2023



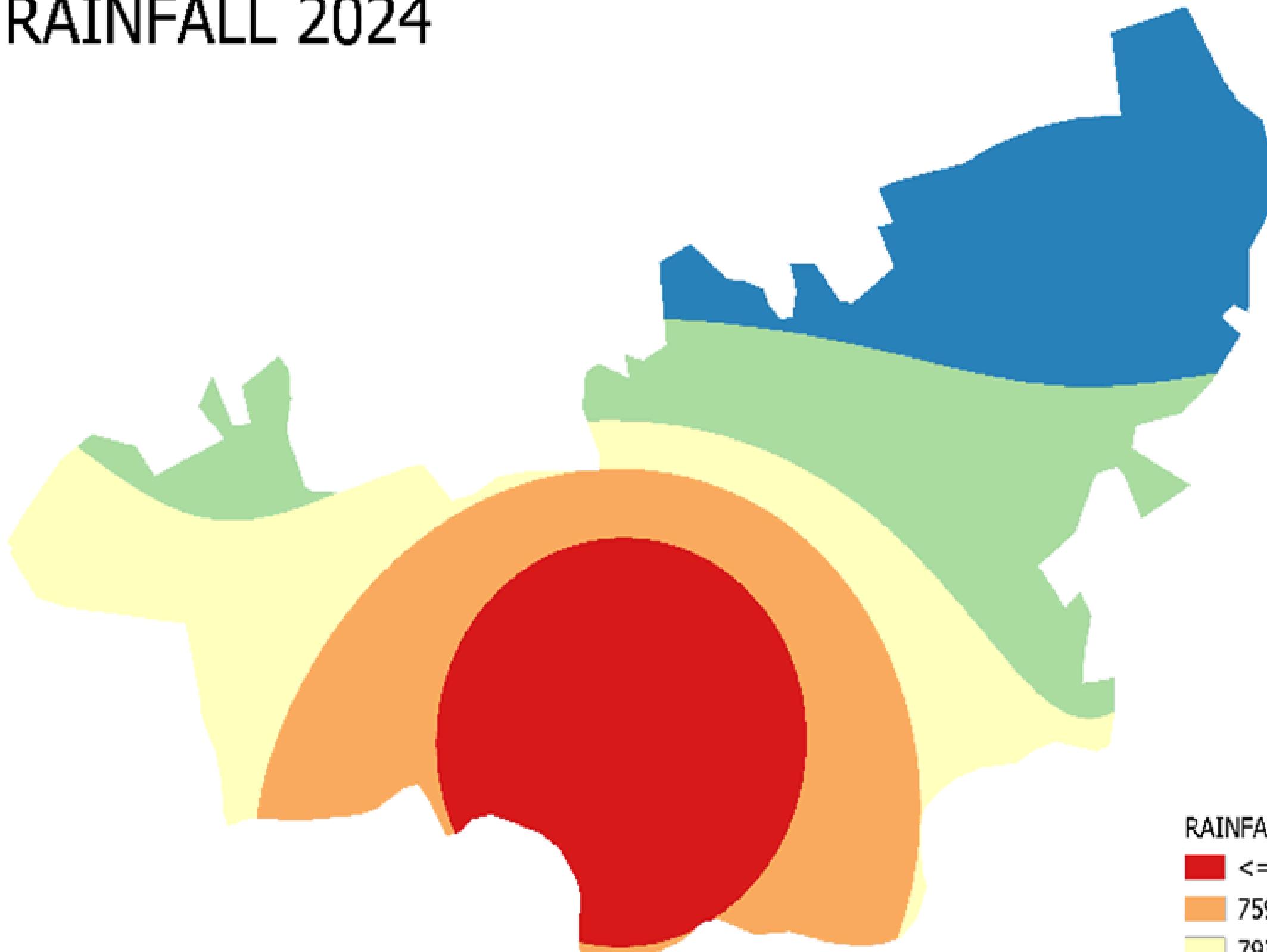
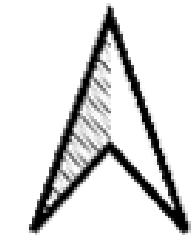
RAINFALL2023

- <= 759.5839 █
- 759.5839 - 793.8213 █
- 793.8213 - 823.4858 █
- 823.4858 - 900.1784 █
- > 900.1784 █

0 5 10 km



RAINFALL 2024



RAINFALL2024

- <= 759.5839
- 759.5839 - 793.8213
- 793.8213 - 823.4858
- 823.4858 - 900.1784
- > 900.1784

0 5 10 km

A scale bar located at the bottom left of the map. It consists of three horizontal bars: a black one for 0 km, a shorter white one for 5 km, and a longer white one for 10 km.



summary

"Spatiotemporal Analysis of NDVI Changes with Rainfall" at Vadgam, Banaskantha, Gujarat to assess how the response of vegetation varies at different time scales to rainfalls. Through analyzing NDVI from 2021 through 2025, the present study identifies trends in the health of vegetation and observes the relationship of variability in rainfall with changes in vegetation. Insights obtained could be used to enhance the prediction of local agricultural productivity, inform land management decisions, and assist in developing strategies in the semi-arid region to reduce the impacts of climate variability and change on vegetation.



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THANK YOU



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