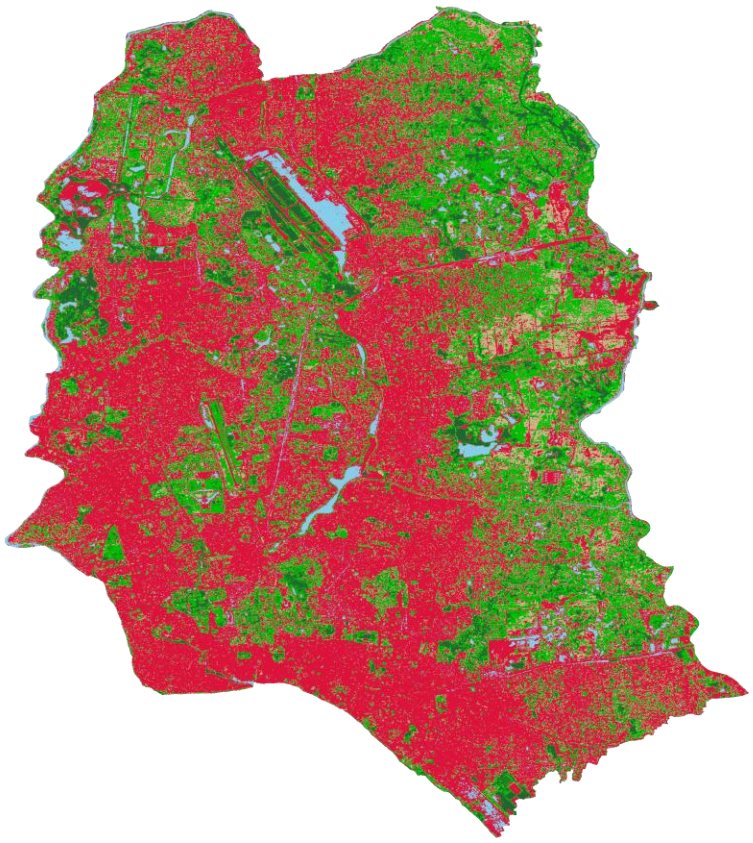
Greenspace Prediction From historical data of 36 years



Explaination:

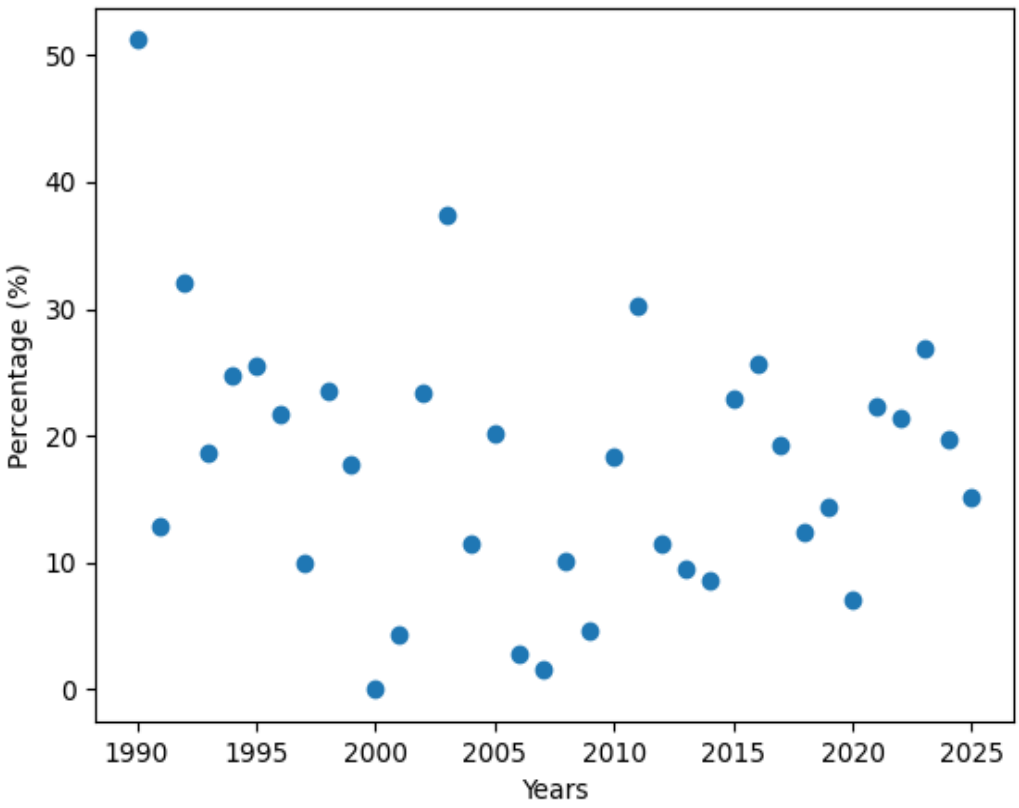
The area of Dhka city is **306.4km^2 .** Elevation from the sea level is almost 30m. Currently, almost 24 Million people are living there. The population density is very much high and built up area is increasing day by day. In 1990, 51% of its total area contained greenspace including grassland, crops and healthy trees according to the images taken from the Landsat-5 in November. Currently, the green space coverage is almost 23.56% according to the Sentinel-2 image analysis with NDVI>0.25, comparatively a huge amount of reduction. Using the historical Data from 1990 to 2025, the greenspace percentages of the next five years have been predicted with Machine learning model. The greenspace coverage has been predicted with non-linear regression model. The model's accuracy is very low which indicates the huge amount of outliers in our dataset from 1990 to 2025.

Errors:

Two images with bands red and nir have been taken as GeoTif file from landsat(30m resolution). Images (1990- 2012) were from Landsat-5 and 2013 to 2025 were from Landsat-8. The NDVI from these two types of images is measured with the formula,

NDVI=(NIR-RED)/(NIR+RED)

NDVI which is greater than 0.2 have been considered as greenspace and mapped accordingly. The view of image is one of the most important factors here. Clouds cover has great impact on NDVI analysis, this is why the NDVI values varies in different time of the same year. Sometimes, the analysis of NDVI becomes very much inconsistent and gives the outliers to our dataset. Consequently, the analysis and model has error and less accuracy in prediction. The scatter plot of year vs greenspace coverage is non-linear and contains large number of outliers.



Solution to errors in prediction accuracy:

The images of different time of the same year should be used and combine them together to fill the actual gap of any image which may create outliers for our dataset.

Sources:

Images:

https://earthexplorer.usgs.gov

Population Data:

https://www.macrotrends.net/global-metrics/cities/20119/dhaka/population

Dataset:

Dataset for Prediction:

https://github.com/106194/My_Greenspace_Analysis/blob/main/greenspace_percentage.csv

Thanawise Analysis from Sentinel-2:

https://github.com/106194/My_Greenspace_Analysis/blob/main/Thanas_Analysis.csv

Satellite:

Name	Images taken from	Land cover per pixel	Purpose
Landsat-5	1990 to 2011	30m	Greenspace Prediction
Landsat-7	2000 to 2012	30m	Greenspace Prediction
Landsat-8	2013 to 2025	30m	Greenspace Prediction
Sentinel-2	Only 2025	10m	To create the map of Dhaka district classifying NDVI values