

# FORESTRY & ECOLOGY

Detection of human &  
natural effects Using  
GIS & remote sensing

STUDY AREA :  
CHANGSARI, GUWAHATI, ASSAM

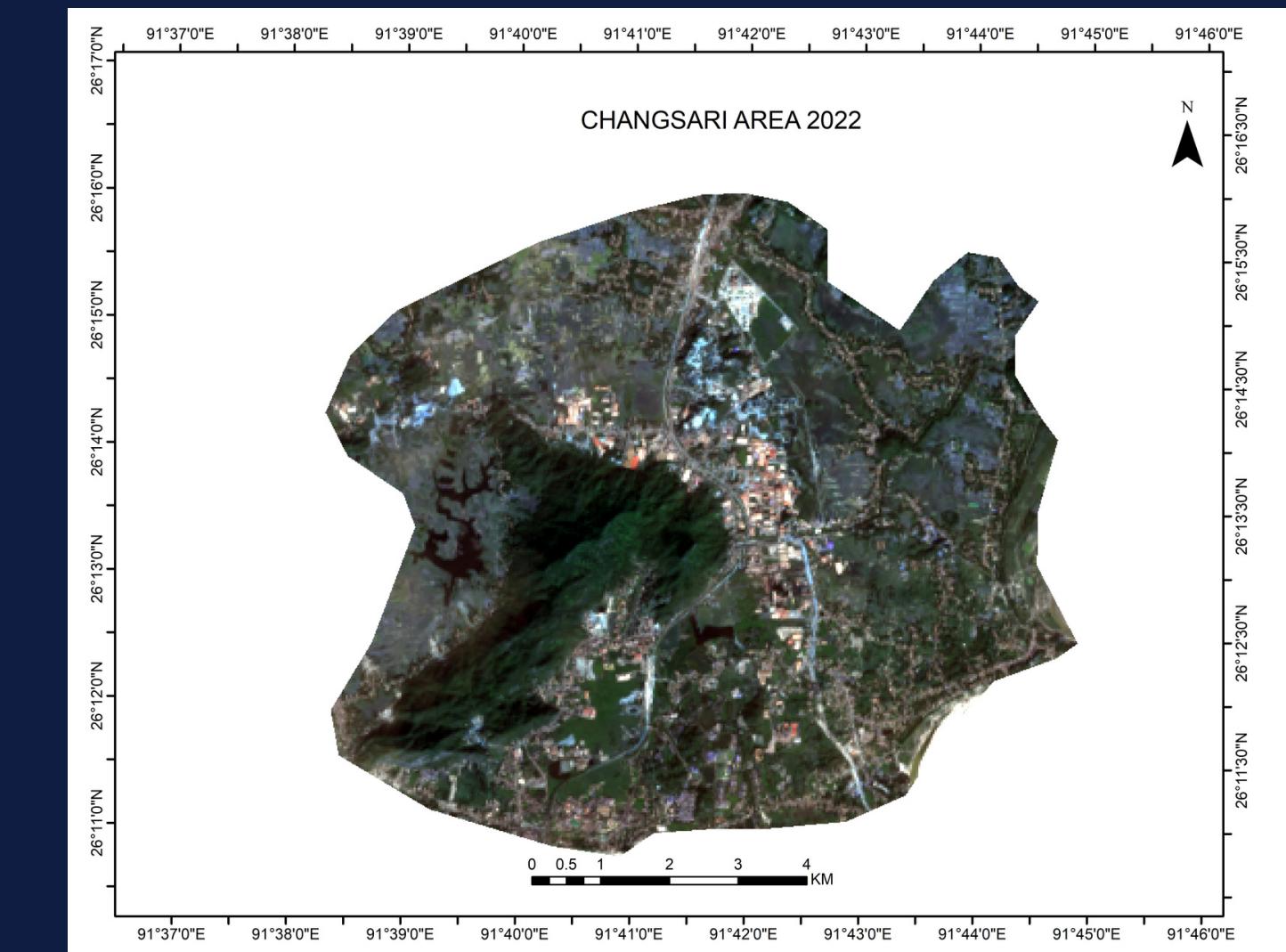
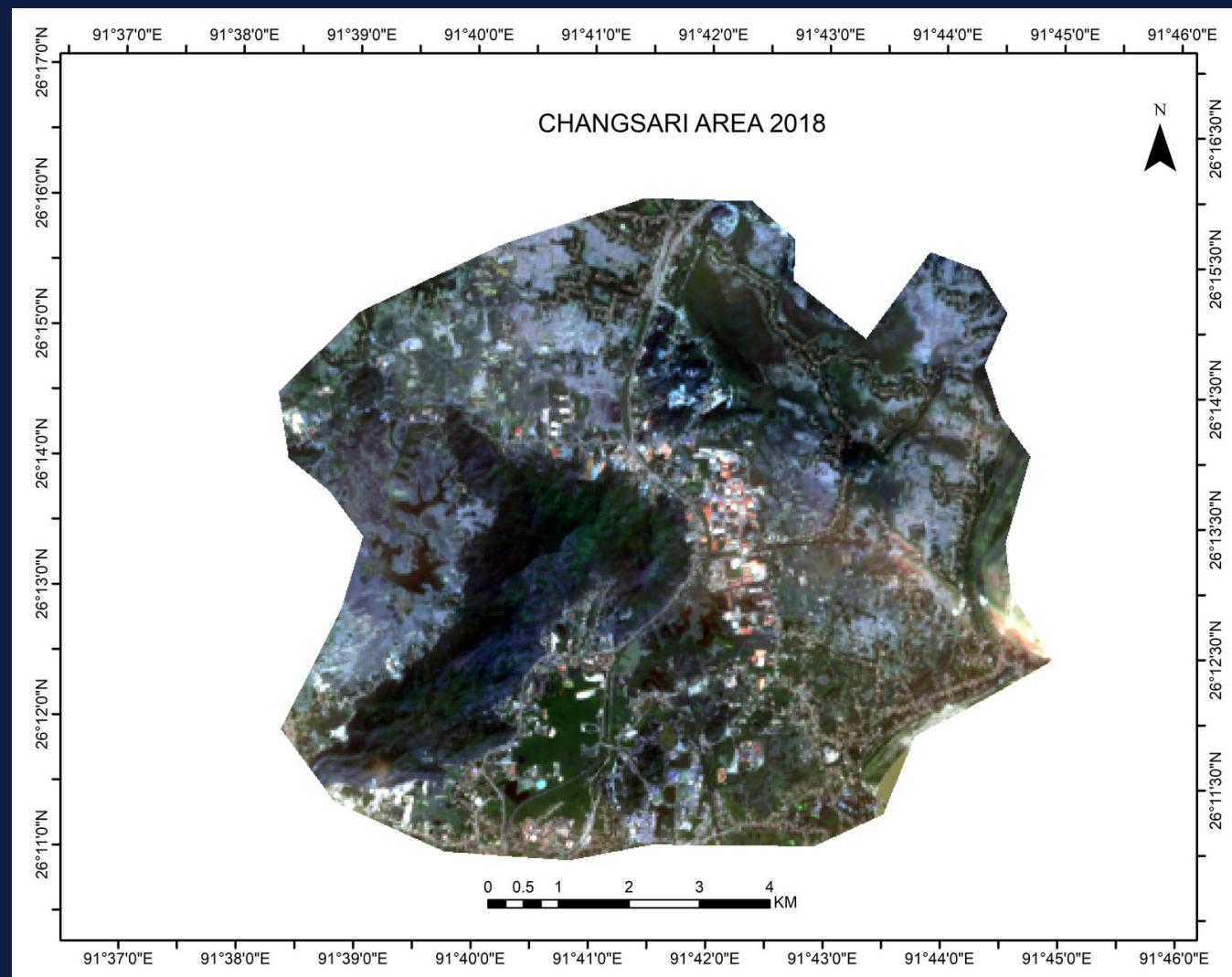
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## INTRODUCTION:

The application of remote sensing and GIS in forestry and ecology has been an important area of study in recent years. Forests play a crucial role in the ecological balance of our planet by supporting diverse flora and fauna, sequestering carbon, and regulating the climate. However, forests are facing unprecedented threats from human activities such as deforestation, agricultural expansion, urbanization, and infrastructure development. To monitor and mitigate these impacts, GIS and remote sensing techniques are used to detect forest cover change and assess the factors driving it.

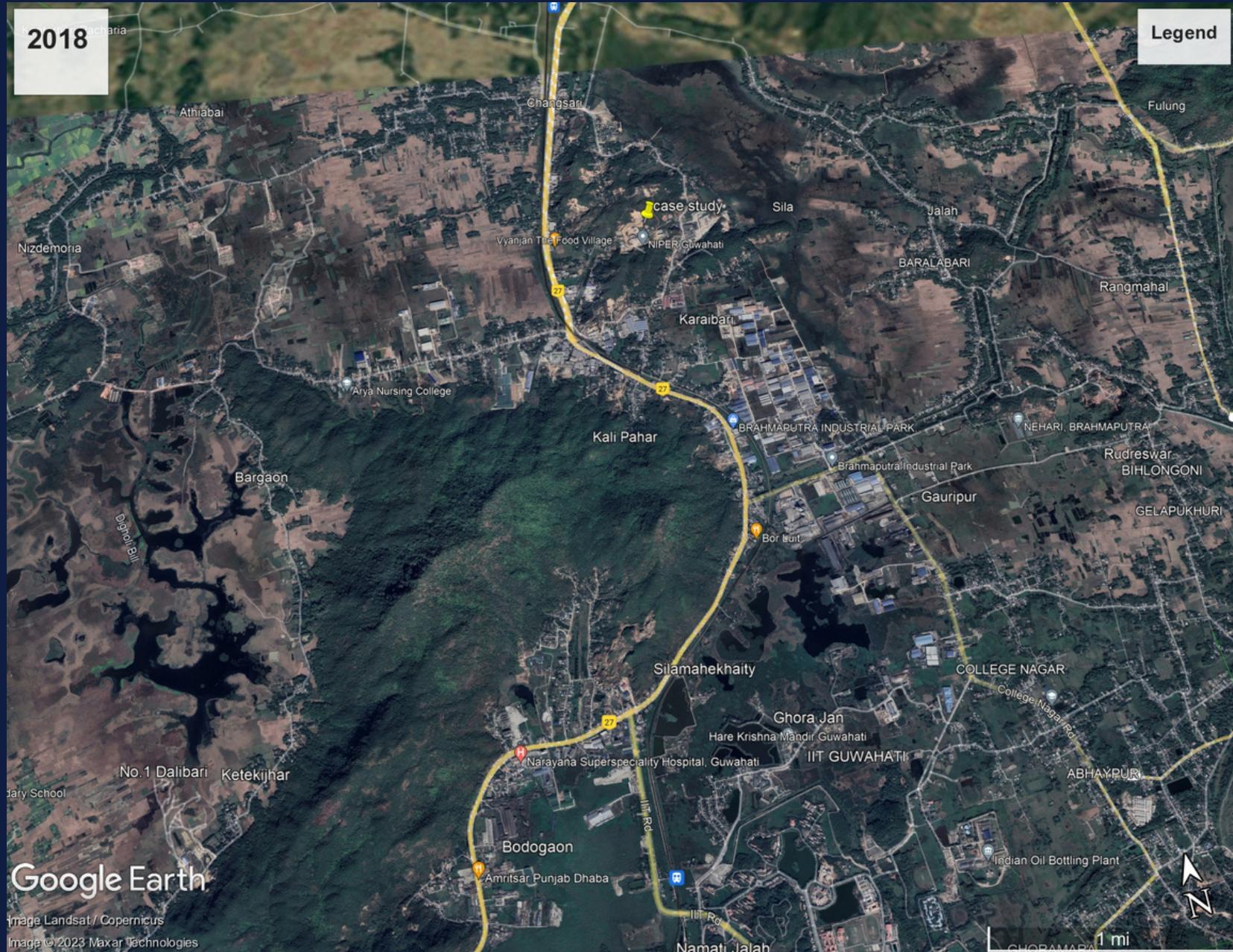
# STUDY AREA: Application of Remote Sensing and GIS in Forestry and Ecology: A Case Study of Changsari area, Guwahati, Assam.

## Satellite Image (Sentinel 2)



# Reference Image

From google earth pro



## Background:

Changsari is located in the Kamrup Rural district of Assam, and it is a biodiversity rich area with a mix of wetlands, forests, and grasslands. The region is also home to several indigenous communities who depend on the forests for their livelihoods. However, over the years, the forest cover in Changsari has been threatened due to various anthropogenic activities such as deforestation, encroachment, and land-use change. This has led to a decline in the ecological health of the region and has affected the lives of the local communities.

## Objective:

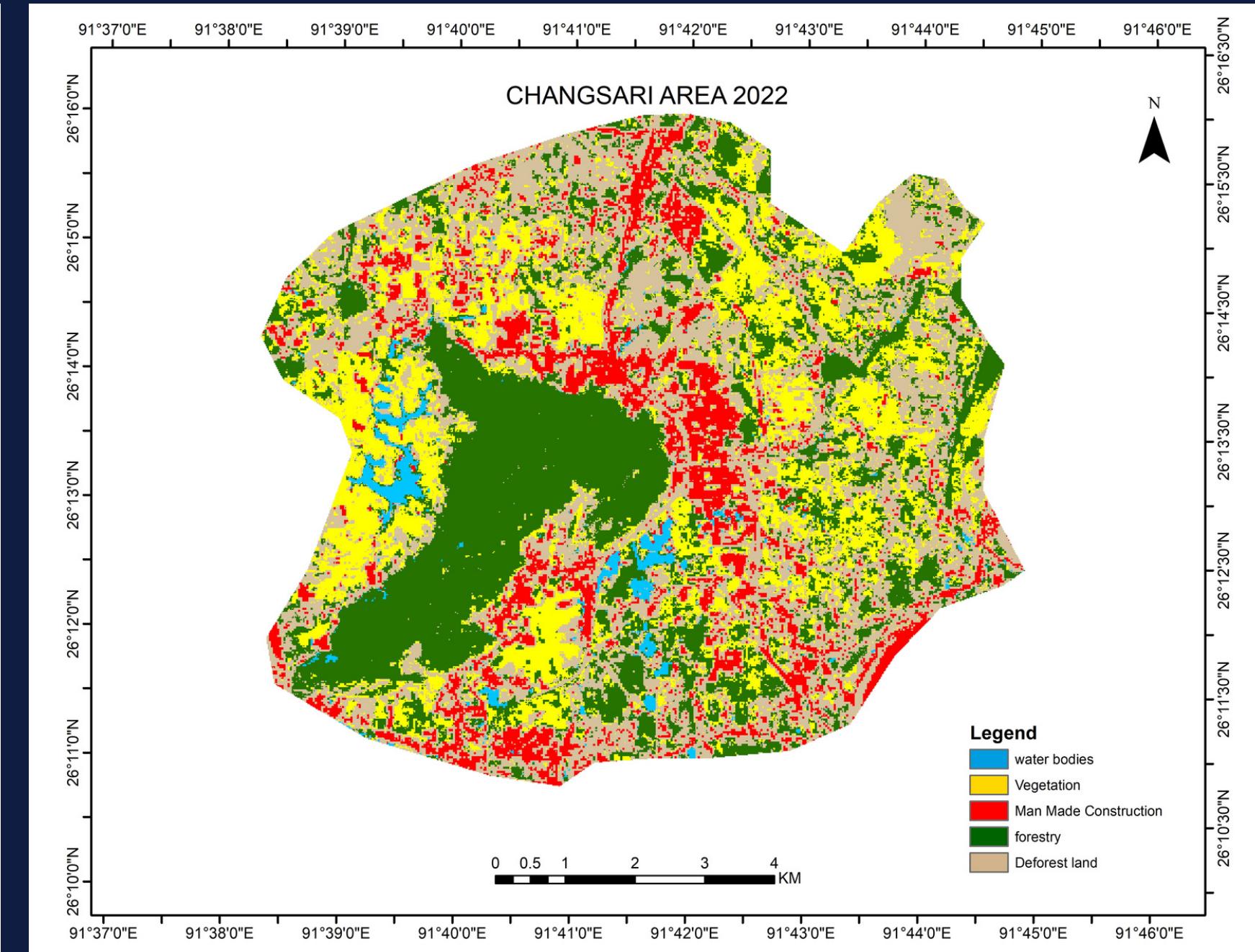
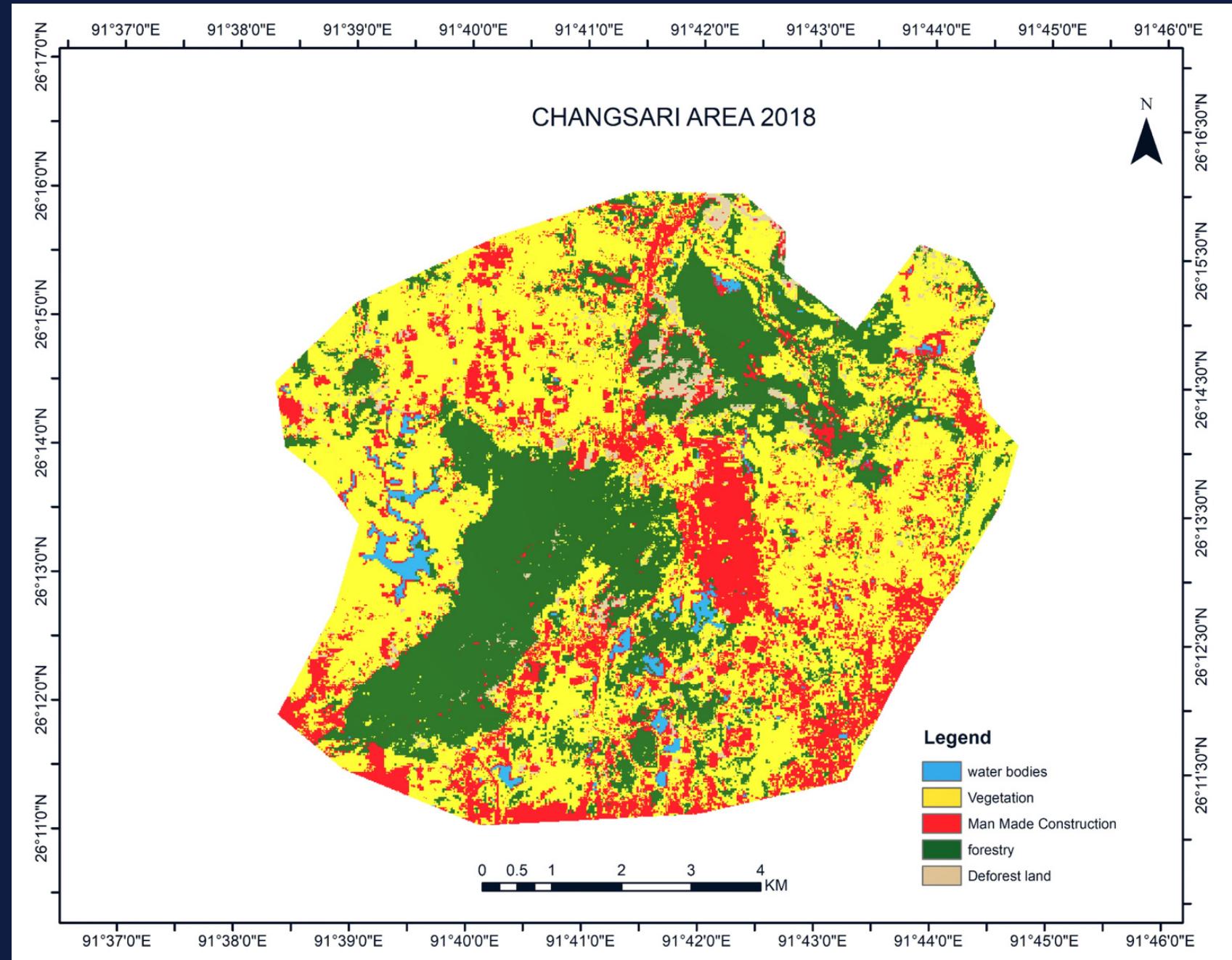
The objective of this case study is to use GIS and remote sensing to detect and analyse forest cover change caused by both human activities and natural disturbances. The study aims to identify the spatial and temporal patterns of forest cover change, assess the factors driving it.

## METHODOLOGY:

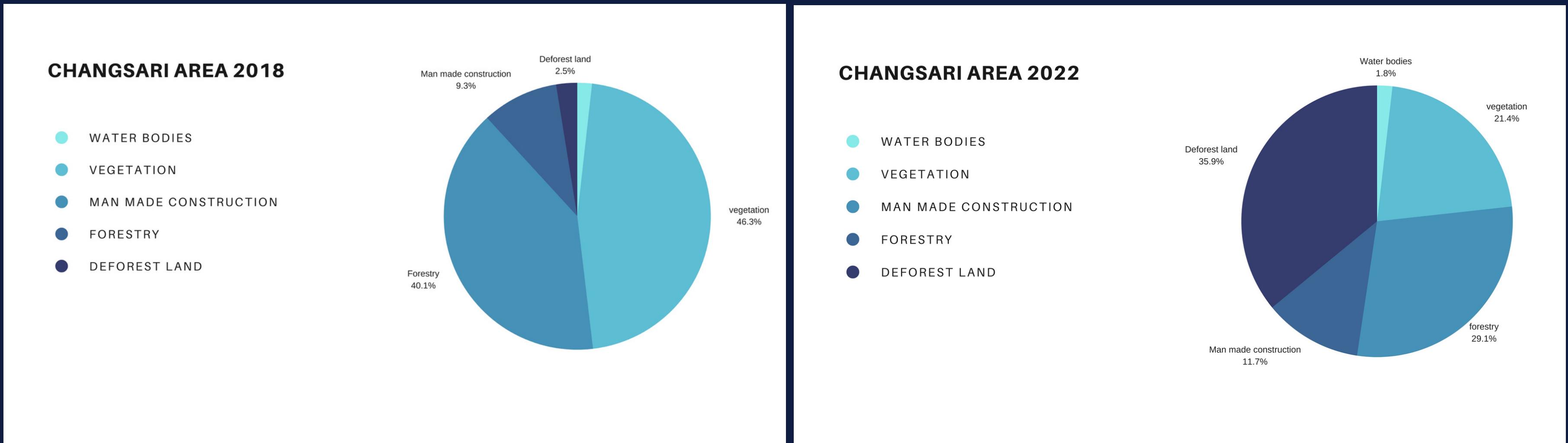
The methodology for this case study involved the following steps:

- Data Acquisition: satellite data was acquired from Copernicus(Sentinel 2) of Changsari, North Guwahati, Assam(2018 & 2022).
- Image Processing: The satellite images were then processed using the ArcGIS and ERDAS IMAGINE software into different classes of forestry, deforested land, man-made construction, vegetation and waterbody by using supervision technique.
- Change Detection: The classified images of Changsari for the years 2018 and 2022 were then compared to detect the changes in land use and land cover.
- Mapping: The final step involved creating maps of the different land-use/land-cover classes in the study area using ArcGIS software.

# Supervise Classified image



# Graphical Representation



## RESULTS:

The results of the study showed that the forest cover in Changsari had decreased significantly over the past decade due to deforestation and land-use changes. From the year 2018 to 2022 the deforest land changed from 1.860324% to 28.225077%, vegetation from 33.84721% to 16.84622%, forestry from 29.26583% to 22.853857%, waterbody from 1.219216% to 1.427304%, and man-made construction from 6.763068 % to 9.18072%.

## CONCLUSION:

The case study demonstrated the use of Supervised Classification of GIS & RS in analysing the detection of human and natural effects in changsari, Guwahati, Assam and the importance of remote sensing and GIS technologies in monitoring and managing the forests and ecology of a region. The results of the study indicate a significant increase in land-use and deforestation and a corresponding decrease in forestry and ecology. This study can be used by policymakers and forest managers to develop effective strategies for conservation and sustainable use of forest resources. The study also highlights the need for continued monitoring of the region to identify changes in the forest cover and to assess the effectiveness of the conservation measures implemented.

Thank you