



Investigating Changes in Nijhum Dwip Mangrove Forest: A Study on NDVI, LAI & Land Use Land Cover

Tahmina Anwar Tonny

Department of Oceanography, School of Physical Science, Shahjalal University of Science and Technology, Sylhet, Bangladesh

Email: tahmianwar75@gmail.com

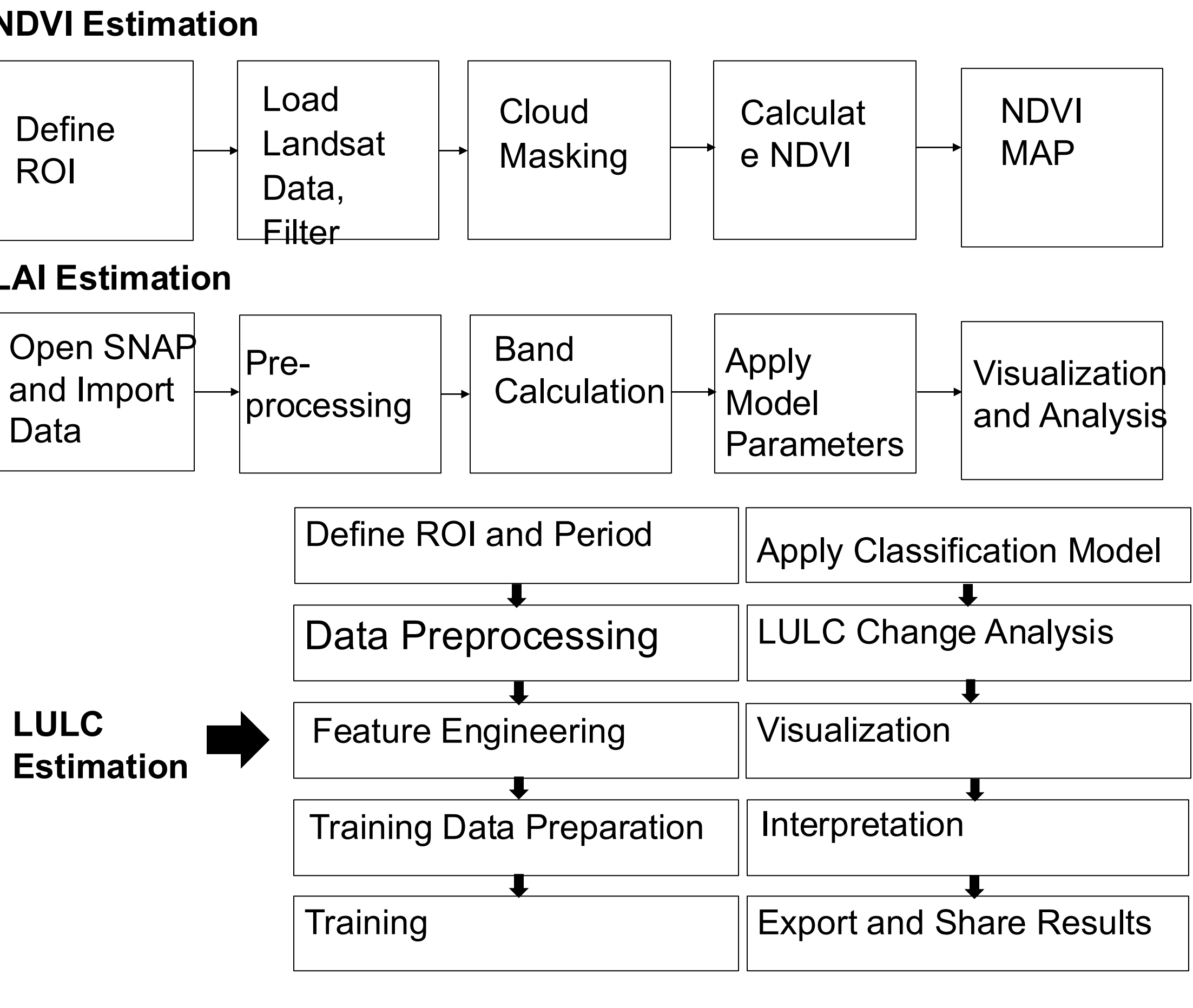
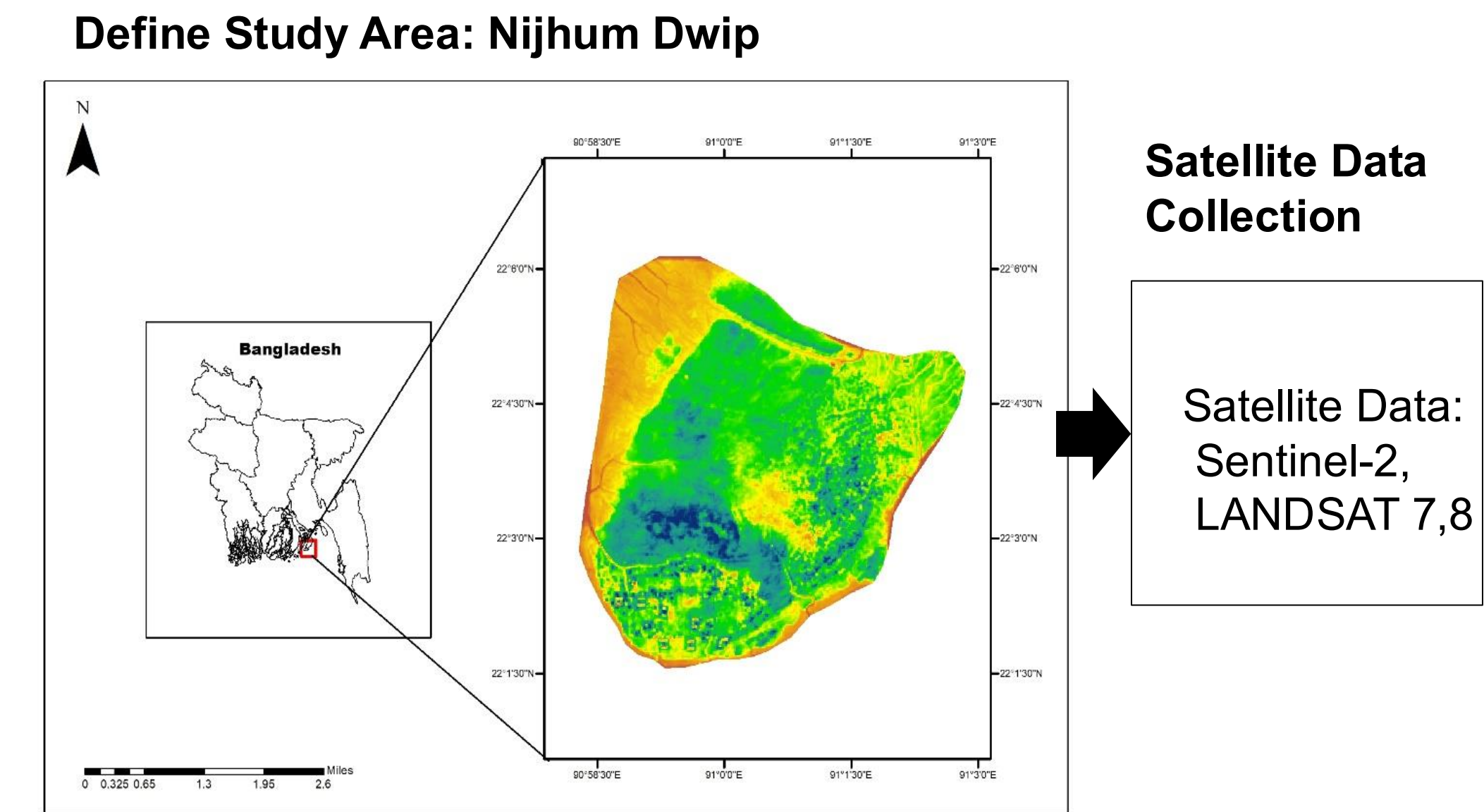
Introduction

- Forest biomass is the total weight of living organisms in a specific area at a given time in a forest.
- NDVI approximates the health of plants by noting how much near-infrared and red light they reflect. Healthy vegetation absorbs more red light for photosynthesis and reflects more near-infrared light.
- Leaf Area Index (LAI) estimation measures how much of an area leaves cover. It provides insights into vegetation density and growth.
- Land Use and Land Cover (LULC) estimation looks at what kind of land use and how they change over time. It is essential for environmental monitoring, urban planning, and resource management.

Objectives

- Investigating the Normalized Difference Vegetation Index (NDVI)
- Investigating the Leaf Area Index (LAI)
- Investigating the Land Use and Land Cover (LULC)
- Investigating the relation between NDVI and LAI
- Investigating the relation between NDVI and LULC

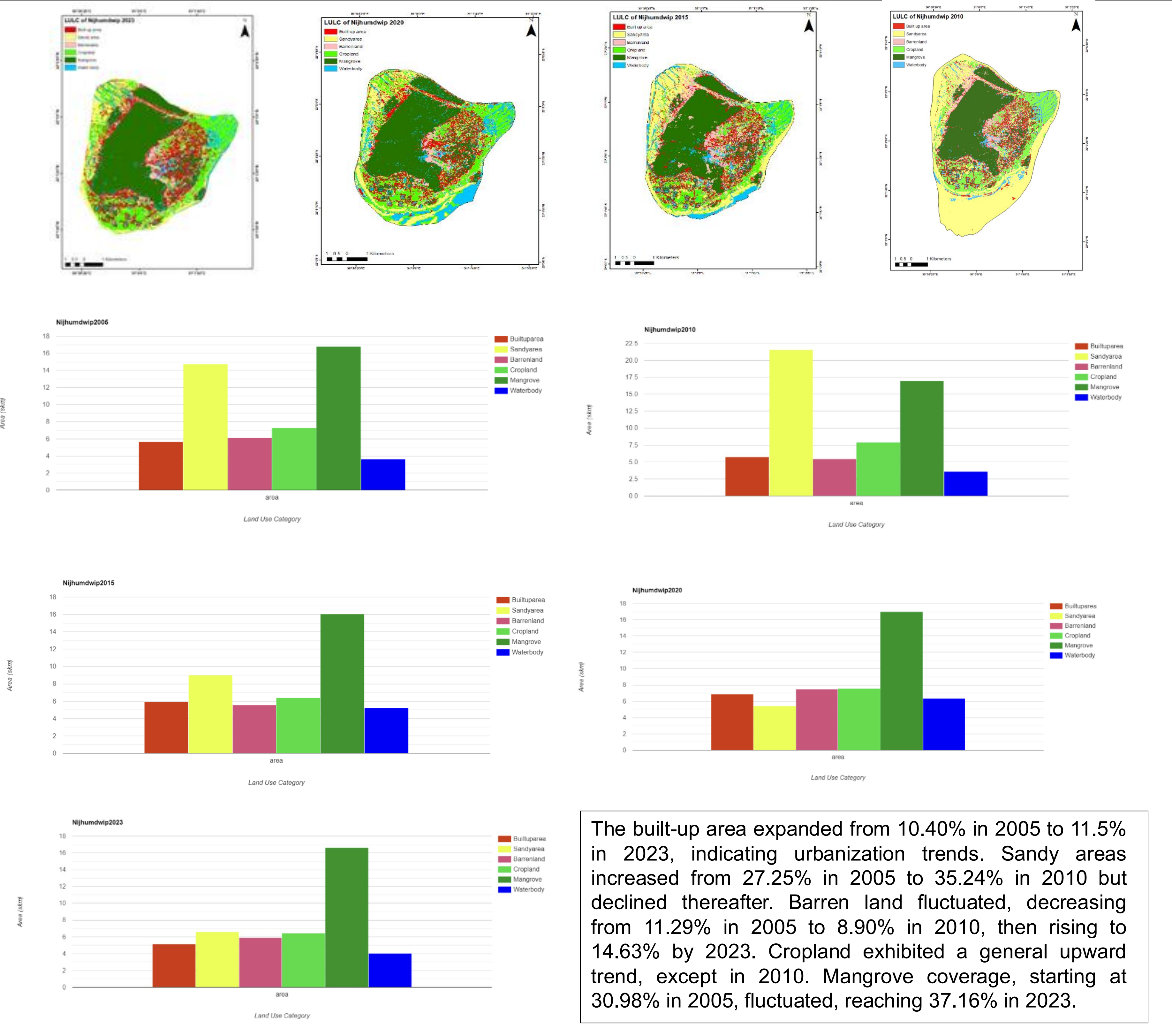
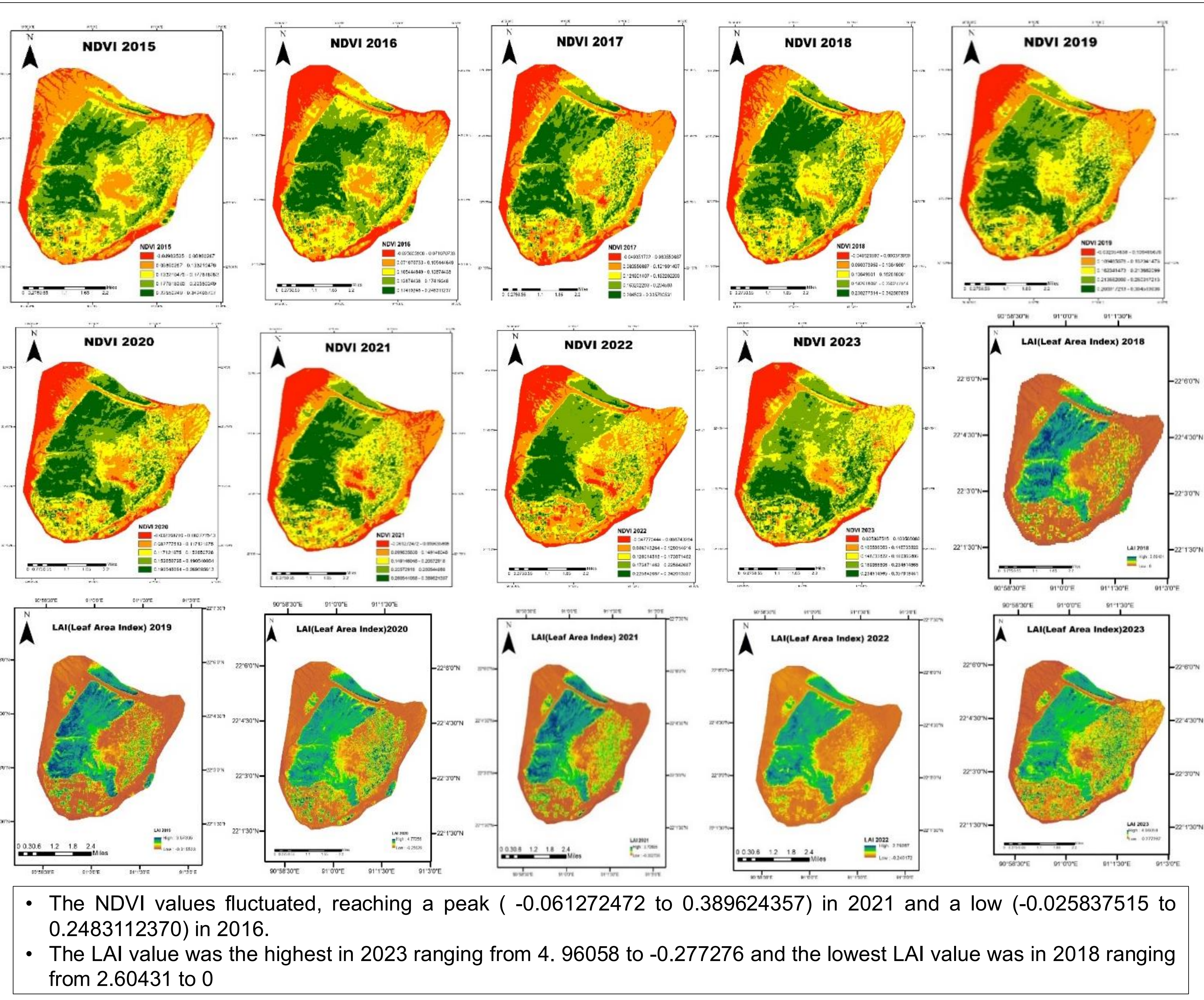
Methodology



Key Findings

- Rising NDVI and LAI indicate increasing vegetation cover and biomass.
- Need for continued monitoring of LULC changes, particularly mangrove cover.

Result



Conclusion

This study highlights the interactive dynamic between human activities and natural processes. Dynamic NDVI value fluctuation can indicate alterations in the health and density of vegetation over the years due to climate change, over exploitation or reclamation of land. Similarly, the LAI values indicate a positive upward trend, which represents an improved quality of vegetation cover and health during this period this is likely due to reforestation. The changes in LULC highlight the large percentage of mangrove area in comparison to land exhibiting people consciousness towards protecting forest biomass.

Reference

Yu, Q., Wang, Y., Van Le, Q., Yang, H., Hosseinzadeh-Bandbafha, H., Yang, Y., ... & Peng, W. (2021). An overview on the conversion of forest biomass into bioenergy. *Frontiers in Energy Research*, 9, 684234.

Dyderski, M. K., & Pawlik, Ł. (2021). Drivers of forest aboveground biomass and its increments in the Tatra Mountains after 15 years. *Catena*, 205, 105468.

Alice, Favero., Adam, Daigneault., Brent, Sohngen., Justin, Baker. (2022). A system-wide assessment of forest biomass production, markets, and carbon. *Gcb Bioenergy*